



INTEGRATING ICT INTO THE TEACHING PRACTICE OF ACADEMICS AT A UNIVERSITY

by

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DEDICATION

This dissertation is dedicated to my Father and Mum, I owe you a lot more than a simple thank you. My gratitude is beyond measure for everything that you have sacrificed for me. I would not have come as far in my life if it hadn't been for you and the examples you set for me.

I would also like to dedicate this dissertation to my beautiful wife. I honestly would not have made it through this program without your unrelenting support. You have been able to set my needs ahead of your own and support me in more ways than one. I would have been lost without you.

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ABSTRACT

Many universities have significantly invested in Information and Communication Technology (ICT) infrastructure. This has been done as a clear manifestation of the confidence that they have in ICT being an enabler to transform the way in which universities conduct their core business. These ICT investments have been informed by the perceived advantages that technology brings to the process of knowledge construction, management, teaching and research. Accordingly, this study utilises Rogers' Diffusion of Innovation theoretical framework to explore how academics have been integrating ICT into their teaching and learning practice at a university in Uganda. This research adopted the qualitative research strategies of case study and narrative inquiry. Qualitative methods were employed to capture the data through a mix of methods, namely, interviews, observations, document analysis and a researcher journal. The garnered data was analysed using the content and thematic analysis methods. The principle participants constituted academics who were selected from seven faculties at the university.

In investigating academics' integration of ICT into their teaching and learning practice, the research findings are as follows. Firstly, the formal academic use of ICT at the university was limited. Secondly, ICT was predominantly used as a tool for preparing and delivering course material, for record management and for networking with academics. Thirdly, these academics also believed that students exhibited increased enthusiasm and interest to learn when ICT was used for teaching and learning. Fourthly, even though there were substantial efforts and positive attitudes from the academics toward the use of ICT in their pedagogical practice, the process of technology integration at the university was inhibited by contextual challenges that impeded the integration into thereof into their teaching and learning practices. Fifthly, and most significant finding is that academics shifted from using the university's ICT Learner Management Systems (LMS) to using Web 2.0 tools, and specifically social media as a means of enhancing their teaching practices.

Key words: Information communication technology, Integration, Pedagogy, Web 2.0 technologies, Social media

EDITING CERTIFICATE

Exclamation Translations

To whom it may concern

The article titled, "Integrating ICT into the teaching practice of academics at a university" has been edited and proofread as of 17 May 2018.

As a language practitioner, I have a Basic degree in Languages, an Honours degree in French and a Master's degree in Assessment and Quality Assurance. I have been translating, editing, proofreading and technically formatting documents for the past seven years. Furthermore, I am a member of the South African Translators' Institute (SATI) and the Professional Editors' Guild (PEG).

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LIST OF ABBREVIATIONS

DOI	Diffusion of Innovation; this is the theoretical framework in the current study
CMS	Course Management System
HEI	Higher Education Institution
ICT	Information and Communication Technology
LMS	Learning Management System
MDG	Millennial Development Goals
MoES	Ministry of Education and Sports
MOOCS	Massive Open Online Courses
MOODLE	Modular Object-Oriented Dynamic Learning Environment
MS	Microsoft
UNESCO	United Nations Educational, Scientific and Cultural Organization
UK	United Kingdom

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CHAPTER 1

ORIENTATION TO THE STUDY

1.1 Introduction

Academics are key players in the successful adoption of Information and Communication Technology (ICT) at higher education institutions, therefore this study explored how academics integrate ICT into their teaching and learning practices. This chapter presents a synopsis of the current study, as well as an orientation to the study. This is organised into several sub-sections, which include the introduction and background context, statement of the problem, and research questions that guided the study, as well as the rationale. This chapter also provides a general overview of the two paradigmatic lenses that guided this study, as well as the theoretical framework that underpinned this investigation. The conceptualisation of terms, research design and methodology are also briefly explained. The chapter concludes with a summary of the succeeding chapters of this study.

The inclination towards a knowledge-based economy has put more emphasis on universities' important role as a repository of valuable human resources (Aleksic-Maslac & Magzan, 2012; Allen & van der Velden, 2012; Delanty, 2001). In many world economies, it has been realised that Higher Educational Institutions (HEI) will continue to play a pivotal role in the globalised world. The growing shift to knowledge economies that are driven by high-technology requires skilled, knowledgeable and competitive professionals, which can be achieved through the continuous reskilling and retooling of human resources. HEI, and specifically universities, are experiencing pressure from the global arena to increase access to quality affordable higher education against the backdrop of decreasing resources (Guri-Rosenblit, Šebková, & Teichler, 2007; Letseka & Pitsoe, 2013; Richards, 2004).

Countries all over the world have made an effort to embed ICT into educational practice to meet the Millennium Development Goals (MDG). The European countries under the umbrella of the European Economic Union have outlined ICT integration in education as a priority and, as such, significant investment in ICT infrastructure for education institutions has been made (Balanskat, Blamire, & Kefala, 2006; Ondieki Makori, 2012; Rampersad, 2011; UNESCO, 2006). Similarly, African countries, and in particular institutions of higher learning, have realised that the development and application of ICT in academic practice will undoubtedly play a leading

role in reducing the knowledge and technological gap between the African continent and the rest of the world (Agbonlahor, 2006; Slaughter & Leslie, 1997). However, the variation in level of e-maturity from one country to another, and more so from one HEI to another, is evident. Seemingly, only a handful of Higher Education Institutions have successfully integrated ICT into their teaching and learning practices (Balanskat, Blamire, & Kefala, 2006).

Governments around the world have formulated policies aimed at optimal ICT integration in innovative learning processes (Blignaut & Howie, 2009; Bryderup, Larson, & Quisgaard, 2009; Chan, 2002; Rampersad, 2011; Sakayauchi, Maruyama, & Watanabe, 2009). Due to this initiative, coupled with the introduction of a new curriculum that places emphasis on the integration of ICT into the learning activities of institutions, institutions have embraced digital learning environments (Venkatesh, Morris, Davis, & Davis, 2003). Similarly, ICT has been placed at the core of reforming educational institutions, as is the case with countries such as the United Kingdom, which has resulted in their Government's deliberate policy to promote ICT education programmes (Hennessy et al., 2007).

The integration of ICT into academic practice is lauded as one of the key means that can turn the teaching and learning process around in Higher Education Institutions (Saunders & Klemming, 2003; Shelly, Cashman, Gunter & Gunter, 2006). Currently, countries worldwide regard ICT skills acquisition as an essential component of basic education, together with the acquisition of numeracy, reading and writing skills (Hanemann, 2015; Hennessy, 2006; Rampersad, 2011; Sonia, 2012; UNESCO, 2006). The integration of ICT into education has been the core focus and attention of many researchers for decades now (Bingimlas, 2009a; Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur & Sendurur, 2012; Fernando, 2012; Loveless, 2007; Tondeur, van Keer, van Braak & Valcke, 2008). The introduction of ICT into mainstream education was widely expected to infiltrate and transform teaching and learning in higher institutions of learning (Shelly et al., 2006).

In Africa and many other developing countries, the integration of ICT into higher education was marred by barriers such as inadequate access to technology, a lack of ICT training and support, and the lack of ICT policies among others (Aduke, 2008; Ayeh, 2008; Bingimlas, 2009a; Munguatosha, Muyinda, & Lubega, 2011; Randolph, 2007; Tondeur et al., 2008). In view of the existing education challenges, the new digital and knowledge society of the 21st century demands that academics move away from traditional ways of teaching and learning towards innovative ways of teaching and learning (Amin, 2016).

The management teams at HEIs are challenged to position their institutions to meet the growing needs, expectations and demands of technology savvy students, as well as keeping abreast of current ICT trends in higher quality education (Garrison & Kanuka, 2004). As such, educators are expected to confront the existing challenges by exploiting the transformation potential of ICT, where teaching and learning environments are increasingly transformed to digital platforms that are critical to ensuring that benefits are realised (Lai, 2011). Hicks, Reid and George (2001, p. 143) explain that higher education institutions need to change and “provide for a larger and more diverse cross-section of the population, to cater for emerging patterns on educational involvement which facilitate lifelong learning and to include technology-based practices in the curriculum.”

HEIs goal to embrace ICT affordances has caused the proliferation of massive online open courses (MOOCs), distant education courses, open access education and cutting-edge courses that may reduce the cost of higher education, offer alternate forms of teaching and learning, and potentially disrupt existing models of higher education (Yuan & Powell, 2013).

1.2 Background context

The numerous reforms by government in the primary and secondary education sectors have had ripple effects on the higher education sector (NCHE, 2013). According to Adam (2003), several education sector reforms have been undertaken so as to transform HEIs with particular emphasis on ICT for teaching, learning and research. Uganda’s higher education sub-sector has continued to register growth in terms of student enrolment in universities. Likewise, the number of registered universities has also increased from twenty nine to thirty nine in the period 2010/11 (NCHE, 2013). The influx of students in universities has exerted pressure on HEIs to increase access to education. Additionally, the closure of technical institutions by government to create universities has also resulted in increased social demand for university education in the country (Andema, Kendrick & Norton, 2013; NCHE, 2013). However, this growth phenomenon has occurred in the face of declining or stagnant unit cost funding for education facilities, infrastructure and academic staff. The growth in terms of student enrolment at HEIs, specifically universities, has not been matched by infrastructure development (NCHE, 2013).

HEIs in Uganda, including public universities, are confronted with the challenge of reduced government funding, which has resulted in restructuring, downsizing, and reengineering amidst an ever-growing demand for university education and stakeholders advocating for quality

service and cost reduction (James, John & Joseph, 2010). The ever-changing higher education environment, especially in public universities in Uganda, calls for the adoption of ICT to meet the needs of various stakeholders. Tusubira, Mulira, Kahiigi and Kivunike (2007) assert that ICT helps reduce pressure on physical classroom infrastructure by supporting online student engagement; enhancing the efficiency and effectiveness of staff and student research collaboration efforts at local and international levels; supporting administrative and academic management processes; as well as offering alternative communication that is cheap, efficient and timely.

In the past in Uganda, there was no direct link between investments in ICT and reform processes in higher education. Recent developments, however, have highlighted the significance of ICT in the higher education reform process with particular emphasis on management applications and access to knowledge in support of research, teaching and lifelong learning (Adam, 2003). Consequently, HEIs, specifically universities in Uganda, should find the financial resources and invest in ICT for teaching, learning, as well as research (James et al., 2010). The unfamiliarity with ICT in many HEIs in Uganda poses serious challenges to users and service providers, more so in public universities since there are high costs for the acquisition and maintenance of both software and hardware, setting up infrastructure, and ensuring regular maintenance (Tusubira et al., 2007). Universities lack ICT expertise in many operational areas and are left to outsource many of the ICT related functions. This further undermines their ICT adoption efforts and, in turn, impacts the country's development and growth (James et al., 2010).

1.3 Rationale for this study

During my tenure as an assistant lecture in the Department of Computing at a university in Uganda, I developed an interest in how ICT tools could be used to enhance the teaching practice of instructors. My interactions with academics have revealed that many of them have not made any effort to use the available ICT tools and educational software in their teaching practices, even when they were well aware of the opportunities created by the use of ICT. This phenomenon created a puzzle that motivated me to try to understand (Stake, 1995) why some academics were willing to change their practice while others were hesitant to make use of ICT in their teaching practices. My interest was further motivated by the fact that HEIs were continuing to invest in ICT infrastructure (Balanskat et al., 2006; Makori, 2012) for teaching and learning purposes, with only a handful of these institutions successfully integrating ICT

into their pedagogical practices (Balanskat & Gertsch, 2010; Garrett, 2003; Kisla, Arikhan & Sarsar, 2009). My professional interest lay in finding out more about the way in which ICT is integrated into higher education, specifically the practices of academics in as far as leveraging ICT to improve teaching in a resource constrained context of a university was concerned. I further wanted to understand how these academics' experiences influenced the educational purpose of their teaching.

There is a dearth of literature on the experiences of academics as they integrate ICT into their teaching practice, particularly in resource-constrained HEI contexts. This investigation aimed to fill the existing knowledge gap of academics' experiences, beliefs, attitudes, perceptions and how these experiences influenced their integration of ICT into their teaching practice. Most of the extant literature on ICT integration efforts in higher education is premised on studies conducted in developed countries (Brown, 2010; Davies, 2011; Edwards & Bone, 2012; Rampersad, 2011; Rienties, Brouwer & Lygo-Baker, 2013). Empirical research on ICT integration that focused on developing countries, especially in the education sector, is limited (Scrimshaw, 2004). Research on ICT in the higher education context of Uganda has concentrated on different dimensions, namely, transforming institutions through ICT (Tusubira et al., 2007); a social networked learning adoption model for higher education institutions in developing countries (Munguatosha et al., 2011); digital literacy in Ugandan teacher education (Andema et al., 2013); and ICT on the margins (Mutonyi & Norton, 2007). None of these studies have investigated the experiences of academics as they make use of ICT. The social, political and economic uniqueness of Uganda, as well as the context of higher institutions of education could provide researchers with a better understanding (Stake, 1995) of how academics in HEI integrate ICT into their practice in a resource-constrained context.

1.4 Statement of the research problem

In today's global economy, organisations (universities included) that want to survive and strive to stay competitive must continuously be innovative across human, material and technological levels (Fillion, Ekiona & Booto, 2012). Many HEIs have made huge efforts to position ICT as a central tenet to support education (Draper, 2010; Mumtaz, 2006; Selwyn, 2007). The developments in ICT and the internet in the past decade (Farrell, 2007) have resulted in institutions spending a considerable amount of resources to procure, install and maintain various ICT equipment and technology infrastructure to complement face-to-face course delivery (Adam, 2003). Investments in terms of material resources, finances, time and training

to create ICT-enabled learning environments for students and academics have been recorded (Altbach, Reisberg & Rumbley, 2009; Czerniewicz & Brown, 2009). Alavi and Leidner (2001) posit that universities and corporate training facilities have invested at an increasing rate in ICT to improve education and training. However, the actual use of ICT at universities by academics remains inconsistent and highly variable from institution to institution and from course to course, even within institutions (Cuban, Kirkpatrick & Peck, 2001; Selwyn, 2007). This is an indication that many academics are still grappling with ICT adoption and integration (Kopcha, 2012).

Although there has been an increase in the number of academics who are eager to integrate ICT into their teaching repertoire, there is equally a large number of academics who are still unconvinced of the need to integrate ICT into their teaching practice (Mehra & Mital, 2007). Various stakeholders are concerned that academics are making limited formal use of ICT in their pedagogical practice despite the increased investment in ICT (Ndawula, 2013; Poirot, 2009; Richards, 2004). Given the continuous investment of educational technology in HEIs, coupled with the ever growing demand for quality distance education, as well as the need to promote lifelong learning, it seems reasonable to investigate why ICT integration in pedagogical practice appeals to some academics, and not to others (Mehra & Mital, 2007). Furthermore, it is argued by Rampersad (2011) that little has been done in terms of assessment of ICT initiatives to determine if the investment has yielded the expected returns, that is, an enhancement of the teaching and learning experience. Universities, lecturers and tutors are constantly searching for better teaching methods, and are developing innovative approaches that are capable of meeting the universities' actual and future demands (Fillion et al., 2012). Since academics are institutionally mandated to incorporate technology use in their teaching repertoire, accordingly there is a need to explore how they are making use of ICT and if that use is making a meaningful contribution to their teaching and learning repertoire.

1.5 Research question

This study is guided by the following main research question:

How do academics at a university integrate ICT into their teaching practice?

Research sub questions

To support the main research question, I proposed two sub-questions:

- What beliefs, perceptions and attitudes do academics hold about integration of ICT into their practice?
- How does the use of ICT influence the educational purpose of their teaching?

1.6 Locating myself within the study

A large part of the role of a researcher is to incorporate reflexivity in their study so as to guard against bias in conducting the research (Surry & Land, 2000). I practiced reflexive reporting by informing the readers through the documentation of my actions, interests and experiences in order for them to get a better perspective of my role in this study (Fossey, Harvey, McDermott & Davidson, 2002). Reflexivity, as defined by Hatch (2002), is the researcher's ability "to keep track of one's influence on a setting, to bracket one's biases, and to monitor one's emotional responses" (p.10). My role as a qualitative researcher is described ably by Glesne (2006) as that of a researcher as a learner. This role was well understood, and I was careful to tell the story of the study participants and not my own.

I took care to avoid any form of bias by employing '*epoché*'. Patton (1990, p.408) posits that *epoché* addresses the researcher's need to become completely aware of any personal bias and to ensure that he or she controls the bias with the aim of eliminating any preconceptions and gaining clarity. In this study, I was careful to separate or bracket my preconceived views on the integration of ICT by academics in their teaching practice (Fischer, 2009). This pre-conceived view allowed me to reflect on all aspects of the research procedure and findings.

1.7 Paradigmatic perspectives

Prior to conducting a study, the researcher must have a philosophical stance concerning the phenomenon and must operate within a particular paradigm. Researchers' paradigmatic approaches will differ because of the different ways in which they view the world, and this will necessitate the selection of an appropriate strategy to observe and interpret the phenomenon under study. In the sub-sections that follow, I discuss my meta-theoretical paradigm (my world-view), which in turn influenced my methodological paradigm (research methods).

1.7.1 Meta-theoretical paradigm: social constructivism

The social constructivism paradigm was deemed appropriate for this study. The importance of culture and context in understanding realities in society as well as deriving meaning based on

this understanding is underpinned by social constructivism. In situating the study as social constructivist, I subscribed to the notion that knowledge is socially constructed as individuals seek to make meaning of the world in which they live and work (Creswell, 2012). Since the central focus of social constructivism is the constant engagement of individuals in developing meaning of their ever-dynamic world, I was cognisant of the need to engage individuals inhabiting the identified social context to gain a better understanding of their experiences as they integrated ICT into their teaching repertoire. In line with meeting the goal of qualitative research, which relies as much as possible on the participants' accounts regarding the study context (Creswell, 2012), I observed the participants' unfolding behaviour as they interacted with one another in their natural setting, in addition to listening to narratives of their life experience.

In this study, social constructivism was construed to mean that academics are represented in multiple selves due to shifts in social contexts and time. These multiple selves are negotiated and constituted within interpersonal relations and cultural contexts (Raskin, 2002), thus the important need for the researcher to interact with the participants in their natural setting to obtain thick and rich data.

1.7.2 Methodological paradigm

In this study, data was collected within a natural setting and as such, my lens identifies me as a qualitative inquirer. The selection of the methodological paradigm was based on the philosophical assumption that the best way to understand a phenomenon is to study it in its natural setting (Krauss, 2005). This approach was appropriate for this study since my interest lay in the lived experiences of people with the aim of understanding how their experiences influence their context-based practices (Creswell, 2012). This involved interacting with the study participants through the qualitative approaches of interviews and observations.

Qualitative research is a situated activity that locates the observer in the world of the participants and allows the researcher to focus on a specific situation and people. Qualitative research is based on the premise that through the participants' use of words and details of their lived experiences, we can better understand a particular phenomenon (Maxwell, 2005). Whilst qualitative research puts emphasis on the importance of the 'emic', which is about gaining the "insider's point of view" perspective, it does not ignore the influence of personal perception on the meanings constructed with regard to the phenomenon, thereby promoting reflexivity

(Manning, 1997, p.105). As a qualitative inquirer, I embraced an inductive style of inquiry (Charmaz, 2006), which allowed for the in-depth exploration of the academics' practices as they integrated ICT into their teaching practice.

1.7.3 Case study strategy of inquiry

A case study is a research strategy that "arises out of the desire to understand complex social phenomena" (Yin, 2003, p.2). A qualitative exploratory case study was considered suitable for this investigation since I was concerned with understanding the phenomenon of 'how academics integrate ICT in their teaching practice at a university' in Uganda (Stake, 1995). Bearing in mind the kind of research questions posed in this investigation and the interpretive stance that I adopted, the case study approach was deemed as the most suitable research strategy for conducting this investigation since it has the advantage of illuminating in detail the distinct beliefs, concerns and perceptions of the different actors in a real-world situation.

The case study approach has been found to be appropriate in circumstances where researchers find it difficult to detach a phenomenon's variables from its setting (Yin, 2003). The case study approach facilitates the exploration of a phenomenon within its context using a variety of data sources (Creswell, 2012; Silverman, 2013). Furthermore, different data sources were garnered to allow for the exploration of the phenomenon from different angles to reveal multiple facets thereof.

1.7.4 Narrative inquiry

This study utilised narrative enquiry as a method of investigation. Narrative research describes the lives of individuals, collects and tells their life stories, and writes narratives of their experiences (Creswell, 2012). The narrative approach was appropriate to uncovering the real world of the participants as a co-constructed narrative by both the researcher and the participants (Clandinin, Pushor & Orr, 2016). By employing narrative research, I took into consideration that a story may be narrated by different individuals, thus reflecting multiple views of the phenomenon in question. Narrative inquiry fits well within the boundaries of social constructivism and critical thinking, which places emphasis on connotations that humans use to make sense of their lives (Neuman & Kreuger, 2003). Moreover, creating a narrative in this study involved making meaning of the participants' experiences through conversations, open dialogue and the on-going lived experiences of the participants (Clandinin, Pushor & Orr, 2016).

1.8 Theoretical framework: Diffusion of Innovation

The Diffusion of Innovation (DoI) Theory by Rogers (1995, 2003) was the theoretical framework that underpinned this investigation in an attempt to understand how academics integrated ICT in their teaching practice. Rogers defines DoI as “the process by which an innovation¹ is communicated through certain channels over time among the members of a social system” (Rogers, 2003 p.12). In this study, diffusion of innovation is defined by the extent to which the faculty at the university have adopted instructional technology for the purpose of teaching. Roger’s Diffusion of Innovation theory seeks to elucidate the process and features that influence the adoption of new innovations (Rogers 1995, 2003). The DoI theory notes that attitude towards ICT is a key element in its diffusion. Similarly, an individual’s reaction to an idea is determined by their perception of the newness of that innovation to the individual. In this theory, Rogers (2003) avers that there is a cloud of uncertainty in the mind of potential adopters when they encounter new technological innovations. Rogers (2003) refers to this process as the innovation-decision process.

The individual’s decision to adopt a particular innovation occurs over time and is not an instantaneous act. Rather, it consists of a series of actions and decisions (Rogers, 1995). The innovation-decision process is defined by Rogers as “the process through which an academic passes from first knowledge of an innovation, to forming an attitude towards an innovation, to a decision to adopt or reject, to implementation of a new idea, and to confirmation of this decision” (Rogers, 1995, p.163). This study was, however, not concerned with examining the innovation-decision process, but rather focused on examining Rogers’ (1995) five perceived attributes of an innovation that tend to have a strong influence on individuals in relation to their adoption decision. The DoI attributes that were examined include: trialability (the extent to which potential adopters can experiment with the new behaviour), observability (the extent to which the results of an innovation are visible to others), relative advantage (the extent to which a new system is perceived as being better than the alternative it supersedes), complexity (the extent to which an innovation is perceived as difficult to understand and use), and compatibility (the resemblance to previously adopted innovations).

¹ An innovation is defined by Rogers as “an idea, practice or object that is perceived as new by the individual” (Rogers, 2003 p.12). Instructional technology is the innovation in this study and included computer hardware and software used for teaching and learning, network infrastructure for communication and other computer related peripherals.

Roger's theory is considered as seminal in explaining the adoption and spread of an innovation in a society over a long period of time (Agbonlahor, 2006). Roger's theory hence offers a powerful paradigm for conceptualising the evolution and acceptance of ICT by academics (Agbonlahor, 2006). In trying to understand how and why new innovations and technology are adopted by academics, Rogers' (2003) theory was employed in this study.

1.9 Research assumptions

The research assumptions that surfaced from a detailed review of the extant literature are presented as follows:

Assumption 1:

That academics' access to technology will culminate in technology integration (Odabasi, 2000; Tusubira et al., 2007).

Assumption 2:

The beliefs, perceptions and attitudes of academics will influence their decision to integrate technology into their practice. In other words academics' beliefs about ICT and its affordances will influence their practice (Faggiano, 2004; Sahin, 2006b).

Assumption 3:

Academics at an HEI would use available technologies as a platform for situated learning or self-efficacy to improve their teaching practice (Townsend, 2010).

Assumption 4:

That integration of ICT would transform the teaching and learning process (Amin, 2016; Hennessy, Ruthven, & Brindley, 2005; Shelly et al., 2006; Sutherland, Armstrong, Barnes, Brawn, Breeze, Gall, Mathewman, Olivero, Taylor, Triggs, Wishart & John, 2004).

1.10 Conceptualisation of terms

Blog: A blog, which is short for web log, is a type of website that includes content-related online entries, or posts, that tend to be written by a specific group of people who provide information and insight, such as technical experts, or people with unique viewpoints. Users scroll through the posts on a blog in chronological order in a manner similar to that of reading a diary or journal (Wheeler, 2010).

Blended learning: “A formal education program in which a student learns: (1) at least in part through online learning, with some element of student control over time, place, path, and/or pace; (2) at least in part in a supervised brick-and-mortar location away from home; (3) and [in which] the modalities along each student’s learning path within a course or subject are connected to provide an integrated learning experience” (Christensen, Horn, & Staker, 2013, p.3).

Constructivism: A cognitive theory that embodies the construction of knowledge by an individual or a group through exploration, discovery, and authentic collaboration (Fosnot & Perry, 1996).

Digital content: In this research, this refers to all teaching and learning content that is in its digital formats, naturally or converted, to support the curriculum, facilitate students’ learning, and collaborate with a digital learning environment (Jones & Brackenridge, 2004).

Education technology: The instructional uses of technology tools; these can include software, hardware, web-based resources. Examples of these are smartphones, podcasts, laptops, tablet computers, course management systems, learning management systems, among others (Jiahou, 2005).

E-maturity: When educational institutions make strategic and effective use of ICT to improve educational outcomes (Osorio, Cifuentes, & Rey, 2011).

Facebook: A popular free social networking website that allows registered users to create profiles, upload photos and videos, send messages and keep in touch with friends, family and colleagues (Caers et al., 2013).

Facebook Live: Facebook Live is a basic feature that offers live-streaming video capabilities to users through the Facebook tool (Jayson, 2016).

Face-to-face teaching: Teaching that is provided through traditional classroom-based channels where the students and teachers meet in person to conduct learning activities (Redmond, 2011).

Higher education: This comprises all post-secondary education, training and research guidance at education institutions such as universities that are authorised as institutions of higher education by state authorities (UNESCO, 2006).

Information and Communication Technology (ICT): This includes digital tools and hardware such as smartphones, laptops, pads or tablets, and other technologies such as audio-visual equipment, projectors, smartboards and various technologies for use in education, development, information, travel and business. It also includes internet, blended learning, online learning, social media, cloud computing, flipped classrooms, learning management systems, email, and online learning opportunities (Toro & Joshi, 2012).

Innovation: An idea, practice, or object which an individual deems as new. The newness of the idea thus triggers the individual to form a reaction of adoption or rejection (Rogers, 2003). In this study, the academic use of technology is perceived as an innovative practice.

Learner-centred education: These comprise teaching and learning strategies that provide time for critical reflection and encourage students to have an active role in their own education through group activities, interacting in the classroom and questioning the subject matter being taught (Dunn & Rakes, 2010).

Learning Management System (LMS): A web-based system that allow instructors and/or students to share materials, submit and return assignments, and communicate online (Lonn & Teasley, 2009).

Lecturer-centred education: Lecturers serve as the centre of epistemological knowledge, directing the learning process and controlling students' access to information (Redmond, 2011).

Massive Online Open Courses (MOOCs): An extension of existing online learning approaches in terms of open access to courses and scalability. They also offer an opportunity to think afresh about new business models that include elements of open education (Yuan & Powell, 2013).

Podcast: Podcasting refers to the distribution of audio/video files in digital format. users can listen to these media by subscribing to and downloading or streaming online using a computer or mobile device through the process of web syndication (McGarr, 2009).

Technology Integration: This is the ability of the faculty to use technology, including computers, digital cameras, storage devices (CDs, DVDs, and flash drives), handheld devices, phones, and related instruments to deliver or enhance the curriculum already in place (Brabec, Fisher, & Pitler, 2004).

Traditional model of instruction: This is teacher-directed, face-to-face, and synchronous (Graham, Woodfield, & Harrison, 2013, p. 5).

Web 2.0: The term Web 2.0 is commonly associated with web applications that facilitate interactive information sharing, interoperability, user-centred design, and collaboration with the World Wide Web. A Web 2.0 site allows its users to interact with other users or to change website content, in contrast to non-interactive websites where users are limited to the passive viewing of information that is provided to them (Dabbagh & Reo, 2011; Murray & Waller, 2007).

WhatsApp Messenger: This is a cross-platform instant messaging application that allows most smartphone users to exchange text, image, video and audio messages for free (Church & de Oliveira, 2013).

1.11 Research design and methodology

Maxwell (2012) argues that a research design addresses the planning of scientific inquiry; designing a strategy to finding something out. Therefore, the design is what the researcher engages in right from formulating the research problem and questions, the determination of the cases, the sampling of participants, as well as data gathering and analysis. This study employed a narrative inquiry and case study as appropriate designs for this study. The selection of these designs was deemed appropriate for this qualitative research since they assisted the inquirer to respond to the research questions as vividly as possible (see Chapter 3 for a comprehensive discussion of the research design and methodology). Figure 1.1 summarises the research design, strategy of inquiry and data collection methods that were employed in this investigation.

Research question	How do academics at a university integrate ICT into their teaching practice?				
Research purpose	Strategy of inquiry				
Qualitative approach Narrative inquiry	Research site Seven faculties at a Higher Education Institution	Participant selection Seven Participants (Purposeful sampling)			
Phases of inquiry					
Data collection methods, instruments and recording	 <p>Interviews * Interview protocol * Digital Recorder</p>	 <p>Observations * Observation Schedule * Still Photography</p>	 <p>Document review * Websites * University artefacts HEI - ICT policy</p>	 <p>Researcher journal</p>	 <p>Informal conversational interviews</p>
Ethical considerations	<ul style="list-style-type: none"> Negotiation with institutional gate-keepers which resulted in permission from concerned authorities (access). Informed and voluntary consent Confidentiality and anonymity of participants Professional conduct of the researcher 				
Data analysis	Content analysis (Inductive thematic analysis)				

Figure 1.1: Research design, strategy of inquiry and data collection methods

1.11.1 The research process and phases of inquiry

In this study, the case is defined and bounded by its particularity to academics' integration of ICT into their teaching practice at a Ugandan university (Malterud, 2012; Stake, 1995). I elicited the experiences of these academics as actors through an intrinsic case study (Stake, 1995). The research site was a university in Uganda that had invested in ICT infrastructure. The principle study participants were academics employed at this university. One academic from each of the seven faculties at the university was purposefully selected to participate in this study. The rationale for purposive selection of the site and participants was that this study is based on the ultimate goal of obtaining data-rich cases to respond to the purpose and research questions of the study (Denzin & Lincoln, 2008). Purposive sampling is justified (Hoyle et al.,

2002, p. 187) by handpicking “the cases to be included and thus develop samples that are satisfactory in relation to our needs.”

This study employed semi-structured, face-to-face interviews as the main data collection technique (Denzin & Lincoln, 2011). In the classroom observations of the academics’ practices, I assumed the role of a reactive observer (Angrosino, 2005). The participant interviews and class observations took place over a period of ten months. Throughout this period, I took the opportunity to conduct informal conversational interviews with the academics (Peräkylä, 2008). I recorded the observations as field notes (Fontana & Frey, 2005) and used a researcher journal as a way of staying focused on the research problem. The analysis of documents (Denzin & Lincoln, 2008) also constituted empirical material.

The data was analysed by employing content and thematic analysis (Silverman, 2013; Stemler, 2001). The data obtained through qualitative means, such as interviews, were transcribed and the transcripts were returned to the participants to ensure that their views had been correctly captured, a practice known as member checking (Creswell, Hanson, Plano & Morales, 2007). Subsequently the transcripts were examined for common and emergent themes using a constant comparison method. Codes were generated from the manual analysis of the data. Initial coding followed by focused coding were two phases that I adopted (Charmaz, 2008). Themes (theoretical categories) were arrived at *a priori*, acquired independently of experience (Saldana, 2012) and guided by the research questions. Open coding was employed to add new codes that emerged (Saldana, 2012). This was a reflective, interactive and iterative process that yielded extensive codes, themes and categories. I conducted multiple readings of the data, organising codes and themes into higher levels of categories within and across the interviews, observations and other data sources (Merriam, 1998).

1.11.2 Enhancing the quality of the study

Research is concerned with producing valid and reliable knowledge in an ethical manner (Merriam, 1998). I attempted to enhance the quality of the study by attending to the issues of the credibility, dependability, transferability and confirmability of the research results (Creswell & Miller, 2000; Patton, 1990).

Credibility

To ensure that my findings were believable from the viewpoint of the participants, this criterion was applied (Lincoln & Guba, 1985). I spent a period of six to ten months in the research field collecting data. This period of time was considered sufficient to have reached a saturation point in the data collection. Moreover, this period of time made it possible for me to identify and verify recurrent patterns (Immy Holloway & Galvin, 2016; Tracy, 2012), a process referred to as prolonged engagement (Clandinin & Rosiek, 2007). Triangulation of the data sources and methods (Tracy, 2012) provided another means of ensuring the credibility of the results. The triangulation was based on the premise that the corroboration of data from multiple sources would heighten the understanding of the phenomenon and the believability of the findings.

Dependability

Dependability refers to the degree to which the presented descriptions or interpretations of human experiences are accurate to the extent that people who happen to share the same experience would immediately take cognisance of the descriptions (Krefting, 1991; Lapan, Quartaroli, & Riemer, 2011; Tracy, 2012). To address concerns related to the dependability of this study, I maintained an audit trail, which explicitly details all of the processes used to arrive at the study results. In this regard, I elaborate on the procedures that I used in the data collection and analysis.

Transferability

According to Merriam (1998), transferability refers to the extent to which the findings of one study are applicable to other settings or situations. In this study, I provided a clear and distinct description of the research site, the selection process of the study participants in addition to a detailed account of the data collection methods and data analysis so as to enhance the transferability of this study. I provided a thick description of the study context, such as the participants' demographics. By providing dense background information and a detailed description of the participants and research context and setting, a researcher is able to enhance the transferability of the research findings (Immy, Holloway & Galvin, 2016). Additionally, I employed constant reflexivity in an attempt to present findings that reflected the participants' experiences within the study context.

Confirmability

Confirmability refers to the degree to which the data and findings could be confirmed or corroborated by other researchers (Lincoln & Guba, 1985). In applying the construct of confirmability, I employed the triangulation strategy. Accordingly, this study employed different data collection methods such as interviews, observation and document analysis as a means of ensuring confirmability. Furthermore, I detailed the decisions taken throughout the research process as a means of justification for the methodological and interpretive decisions that were made in this investigation. I ensured that there is an ‘audit trail’ that could allow the researcher to follow up on each step of the research process and procedure described. This was a measure taken to achieve research rigour. In order to assess the study’s trustworthiness, it is important to discuss the steps that were involved in achieving the end product in addition to presenting faithful accounts of the narratives reported (Horsburgh, 2003). In this investigation, I maintained detailed notes relating to the contextual setting of the data, the motivation, as well as the rationale for the decisions related to methodology (Glaser & Strauss, 1967; Ryan-Nicholls & Will, 2009). Additionally, I make available all of the processes documenting this study, the data collection, collection instruments, and data analysis in the relevant appendices (Sandelowski, 2000). The quality criteria issues are addressed more comprehensively in Chapter 3.

1.11.3 Limitations of the study

Limitations are important in establishing boundaries and exceptions inherent in a study (Creswell, 2012; Creswell et al., 2007). In any given study, limitations occur and are scrutinised to identify what might have weakened the findings of the study.

The limitation of this investigation is based on the fact that the selected sample only reflects experiences of some academics at one university. This therefore means that the findings from this investigation cannot be generalised to all academics at higher education institutions. However, this study was not aimed to generalise findings, but rather to give insight into the experiences of academics in their integration of ICT at a university in Uganda. Furthermore, it was not my intention to unearth an absolute truth or universal law that applies to all academics in Uganda, however, this study gave me the leverage to study in depth a case that represents the lived experiences of academics.

It may be difficult to maintain a completely bias free study given the researcher's intimate involvement as the main tool of data collection in this investigation. However, the researcher was constantly cognisant of this close involvement and how it could bring his own views and values into the investigation as he interprets the views of the participants. I thus employed 'bracketing' (Ahern, 1999) in an effort to set aside my researcher assumptions and influence in order to elicit the reflected experiences of the respondents. Creswell et al. (2007) opine that all qualitative researchers bring values to a study and, as such, they must recognise the value-laden nature of data collected from the field.

1.11.4 Ethical issues

Any research study is carried in a setting that has its own common values, cultures, beliefs, population, and identities. Qualitative researchers may be ethically conflicted as their research may involve some degree of personal involvement in the lives of the research participants. Special attention was given in this research to ensure ethical conduct in order to maximise the beneficial effects and minimise any harmful consequences of this study (Silverman, 2013). In order to guard against harmful consequences, a number of ethical issues were taken into consideration during the course of this study.

Before conducting the study, I requested permission from the relevant authorities and the university authority before contacting the potential study participants. Clearance was sought from the ethics committee of the University of Pretoria before embarking on data collection in the field. After securing the necessary certificates, I then made contact with the prospective study participants. All of the participants that agreed to participate in this study signed a letter of informed consent indicating that they had voluntarily accepted to be part of this study. The consent specified all issues such as right to withdraw, anonymity and data (**See Appendix E**). Additionally, this study scientifically acknowledges and recognises all authors of the literature consulted in order to avoid bootlegging.

1.12 Conclusion

ICT offers affordances (Brown, 2012; Gautreau, 2011; McCarthy, 2010; Prensky, 2001) for academics at HEIs to enhance their pedagogy, but there is not always acceptance of such ICT opportunities. Brill and Galloway (2007) aver that whilst ICT may be used by academics, the ways in which it is used may not be deemed as technology integration. Academics believe that

ICT positively influences their teaching practice and student learning through the creation of an active learning environment (Brown, 2012). There is, however, a need to better understand how and why academics integrate ICT into their pedagogical practice if ICT is to be successfully integrated in HEIs. This study sought to explore how academics at a university were integrating ICT in their pedagogical practice beginning with understanding why and how they used the available technologies.

1.13 Outline of chapters

Chapter 1

Introduction: The focus of this chapter was on the background information leading to the study. This gives a justification for the study and provides the context of the university academics. This introduction also presents the problem statement, purpose of the study, research questions, rationale for the study, an overview of the research design and the research layout. I note the strategies used to ensure credibility and the ethical considerations of anonymity and confidentiality. I end this chapter with an overview of the thesis.

Chapter 2

Literature Review: This chapter presents the relevant literature from empirical studies in the field of ICT adoption in teaching and learning both locally and internationally in the context of higher education. It also delves into debates on academic beliefs, perceptions and attitudes in as far as integrating ICT in teaching practice is concerned. Primarily, the review of the literature was to establish what is already known in the field of my proposed study with particular interest in identifying gaps and silences in the field that gave credence to this study. This chapter concludes with the theoretical framework (theory of technology diffusion specifically the Diffusion of Innovation Theory), which acts as a scaffold for this study.

Chapter 3

Research Methodology: This chapter highlights the research design and methodology. This chapter presents the meta-theoretical and methodological paradigms that underpin this study. It is further explained how the case was selected, the research site and the participants, as well as the data collection approaches that were employed in this empirical research. The qualitative analysis methods used are explained in this chapter and issues of trustworthiness are elaborated on to enhance the quality of the study.

Chapter 4

Research Findings: This chapter presents the findings and discussions of the data and information collected from the interviews, observations and document reviews in form of themes and sub-themes that emerged from the study. The emergent themes represent the experiences of the participating academics. The essence of this chapter is in analysing the data obtained from the academics as a unit of analysis.

Chapter 5

Discussion and Analysis of the Findings: In this chapter, I present a summary of the key findings and I situate the findings of the study within the extant literature discussed in Chapter 2. I also engage the findings with the theoretical framework of this study and reveal new knowledge that has emerged from this study.

Chapter 6

Conclusion and recommendations: This chapter presents a review of the thesis, a discussion of the key findings, the implication of these findings, and also highlights the limitations of the current study. Subsequently, I offer some recommendations in this regard, as well as suggestions for further research. The thesis is then drawn to a close with my final conclusions.

CHAPTER 2

EXPLORING THE DEBATES IN THE FIELD

2.1 Introduction

This chapter reviews the extant literature that is relevant to this study. Moreover, issues synthesised from the literature are discussed. This chapter highlights the various types of technology in use by educationalists, more specifically from the ICT integration perspective and its use in education, particularly in higher institutions of learning. The debate extends to the practices and import of ICT integration in academic practice in teaching and learning. From there, the review of the literature expands to address barriers to integrating technology. This chapter also summarises what is already known about the topic and lays the foundation for a theoretical understanding of the research problem. By conducting this literature review, I was able to construct an essential understanding of the roles and challenges, as well as best practices in integrating ICT into teaching and learning.

The literature reviewed was derived from the following electronic databases: Emerald insight, Education Research Complete, Education Resources Information Center (ERIC), EBSCOhost, Computers & Applied Science Complete, SpringerLink, Google scholar, ProQuest Central, Google books and JSTOR. Sources also included conference presentations, scholarly journal articles, white papers, electronic and online only articles, government reports, university newsletters, papers from national and private organisations, as well as dissertations and educational books. Although the majority of the research that was reviewed in this study was conducted in the developed world, a number of studies from the developing world were also examined. The research applied to this investigation was published between 2000 and 2017. Literature and international studies carried out before 2000 were included because the research either demonstrated an important contribution to the field under investigation or because its inclusion represented vital evidence in support of instructional technology advancements or developments. The keywords used to search the literature included educational technology, ICT integration, higher education, student engagement, social media, professional development, technology competencies, barriers to technology integration, 21st century technology skills, technology integration models, perceptions, beliefs, culture, integration, e-learning, blended learning and Web 2.0 technologies.

2.2 Rationale behind integrating ICT into Education

In response to a wave of education sector reforms and the promise of ICT in teaching, learning and research, HEIs have undergone various transformations. This has been intensified by the increase in the number of students joining Higher Education (HE). The change in the social and economic roles of HE and the falling number of qualified instructors have compelled academic institutions to work towards self-sustaining, learner-centred providers of education in a rapidly changing, borderless world (Amin, 2016; Redmond, 2011; Till, 2003).

The rapid growth and convergence of ICT have pushed academic institutions to respond to new ways of knowledge creation, management and distribution. In the past ICT, was not given much attention in the higher education reform process, especially in Africa (Adeoye et al., 2013). ICT was isolated from the reform process, and it was only a few technology orientated departments like computer science, engineering or technology-savvy individuals that took interest. Most recently, it has become apparent that HE reforms cannot prevail without paying proper attention to ICT, more so to applications in education management, administration and access to knowledge in support of teaching, lifelong learning and research (Amin, 2016; Fong et al., 2014).

All industries, including higher education, are moving towards globalisation (Altbach et al., 2009). This warrants thought and planning in the area of ICT driven education and, more so, distance education. The increasing competition among HEIs and the relevance of digital narratives have warranted an increase in demand for educational technology. Cultural characteristics at macro, societal level and the micro, institutional level have also required universities to rethink their current methods of communication and association with others. This paradigm shift calls for a need to match developments in the administrative services with curriculum delivery in education institutions (Sadykova & Dautermann, 2009).

The desirability of ICT in teaching and learning has been a subject of some contention in the education community for a long time (Adeoye, Oluwole & Blessing, 2013). The unprecedented growth of ICT has accelerated the intention of using ICT in advancing educational goals (Ben Youssef & Dahmani, 2008; Tan, 2011). This is partly because of the conviction that ICT is crucial in restructuring the education landscape as a way of responding to present-day information needs (Monahan, 2008; Sturko & Gregson, 2017). Recent developments in ICT around the world have meant that ICT is not limited to aiding teaching and learning, but is now

playing a pivotal role in reshaping the teaching and learning landscape through delivery of instruction and assessment. This is changing the education landscape from an industrial society to a knowledge-based society (Haddad, 2003; Schoonenboom, 2014; Yuen, Law & Wong, 2003).

The enabling role played by ICT has created a strong demand for institutions to invest in computing facilities and an equally skilled and knowledgeable workforce that will be able to produce technology savvy students in both developed and developing countries (Ali, 2012). Without doubt, ICT can turn instructional processes around, as well as facilitate students' learning. This is evidenced in the findings of Fillion et al. (2012) where the quantitative results indicated that online students found learning more effective and were more satisfied than their peers taking their courses on site.

Furthermore, ICT also presents new avenues for improving the delivery, quality of teaching, as well as learning through the encouragement of collaborative teamwork among academics. This will make their practice more visible to the public and will accrue a host of other benefits as a result of using ICT. This has prompted governments all over the world to adopt measures that promote the development and usage of ICT through the provision of incentives for computerisation and automation in order to create an environment that will facilitate innovation in the education sector (Archibong, Ogbiji & Anijaobi-Idem, 2010; Schneckenberg, 2009; Sturko & Gregson, 2017)

2.2.1 21st Century learning

The rapid evolution of ICT is one of the changes that we are experiencing in the 21st century (Pheeraphan, 2013). The world is increasingly becoming competitive and yet more dependent. Today's challenges demand that we come up with innovative solutions in a complex world that is confronted with numerous business, environmental, technological, political, health, scientific and social issues. Florida, Mellander and Stolarick (2008) argue that innovation and knowledge drive global economies, and that the future will require an innovative workforce comprising people who are lifelong learners.

The changes experienced today call for new forms of learning that are receptive to the continuously evolving world. Students ought to acquire 21st century skills and new ways of thinking if they are to remain competitive (Pheeraphan, 2013). Keengwe, Onchwari and Wachira (2008) and Mishra and Kereluik (2011) argue that there is a need to reconfigure the

schooling system to meet the demands of our changing world. As such, there have been efforts to ensure that higher-order cognitive process such as creative problem solving and critical thinking are emphasised in the education process (Mishra, Koehler & Henriksen, 2010). There are suggestions that students should engage in ICT-rich learning contexts where they can work collaboratively to solve multi-disciplinary, complex and open-ended challenges (Ananiadou & Claro, 2009).

Whilst there is little doubt that the education process should change to address the challenges of the 21st century, there is also a need to address the learning content presented as well (Law, Pelgrum & Plomp, 2008). Most recommendations have ignored content and often do not mention what is to be learned. It is problematic to ignore content or to conceptualise it in traditional ways (Mishra et al., 2010) as emerging ICT has impacted the content of education curricula. Amin (2016) avers that education institutions today see a need for their graduates to be in a position to demonstrate suitable levels of information literacy. Graduates, therefore, should be in a position to identify, establish and assess appropriate information in order to solve any given problem. This is resultant from the decisions made by institutions to ensure that their graduates are not only knowledgeable and skilled in their subject domains, but that they also possess generic skills such as the ability to reason formally, communicate effectively, solve problems, negotiate outcomes, collaborate and work in a team. The increasing use of ICT as an indispensable tool for everyday use has expanded the generic skills to include information literacy, and it is likely that its application will grow this set of skills even more (Adeoye et al., 2013).

2.2.2 ICT use in higher education: *What tools are employed?*

According to Price and Kirkwood (2013), there are a number of ways in which universities and faculties view ICT in institutions of higher education. These relate to record management, student admissions, enrolment, classroom and faculty scheduling, graduate placement, alumni relationships, book purchases, recruitment and other general logistics. These general views lend themselves more to the administrative function rather than to the faculty members' practice.

Various ICT tools and software may be integrated into pedagogy (Salehi, 2012) with some tools being designed for specific purposes and many others for use of a general nature. The choice of technology and the way it is integrated can also be associated with the different learning theories that can be used to elucidate or predict the benefits that may be derived from learning using these

technologies (De Salas, 2015; Goldie, 2016). In this regard, high institutional investment in ICT infrastructure has been made in many conventional universities to support more flexible models of teaching and learning (Altbach et al., 2009; Phillips, 2005). Virtual Learning Environments (VLEs) or similar systems have been established (Brown 2002). Such platforms, for example, Blackboard and Moodle, have been incorporated by many HEIs into their trade, conferencing, emails, chat rooms, and telephones and thus characterise today's modern Higher Education environment (Phillips, 2005; Price & Kirkwood, 2013). Although the introduction of ICT has shone a light into some of the possibilities in higher education, one would be mistaken to believe that these new technologies will replace the traditional modes of instruction and delivery, in most cases, these will complement each other in some form of synergetic relationship (Price & Kirkwood, 2013).

Even though higher institutions of education are equipped with a number of computers, their usage by faculty is still minimal, and it has been argued that technology's role in any organisation will be felt only when the intended users of this technology put it to work (Agbonlahor, 2006). This is largely determined by awareness, willingness and the ability to use the tools available. Academics constitute an important cluster of users whose role in the successful implementation of ICT is unquestionable. Suffice it to say that ICT integration in higher institutions of education is not only dependent on the beliefs and methods of both faculty and students, but also on ICT access and availability (Alkhalfaf, Drew, AlGhamdi & Alfarraj, 2012; Challis, Holt & Rice, 2005; Georgina & Olson, 2008; López-Pérez, Pérez-López & Rodríguez-Ariza, 2011).

The proliferation of ICT in the 21st century has presented numerous challenges for higher education institutions in many countries, and there has been a rather slow pace in meeting these challenges. According to Patzer (2010), "Numerous online learning programs, high-tech mobile devices, social media applications, and the accompanying modifications in teaching practices revolutionized the academic world" (p. 1). Today's students are quite knowledgeable in ICT use and application, moreover, they value and have strong beliefs about the use of ICT in their daily lives and as such look forward to joining universities that aspire to become technology enabled so as to remain competitive (Crowson, 2005; Price & Kirkwood, 2013). Organisations have argued that there is a need for educational institutions to integrate ICT into their teaching and learning to aid in preparing students for their future careers. This is based on the premise that ICT, when used correctly, improves the quality of learning, increases access

to instructional tools, and enhances the technological skills of students (Patzer, 2010). Joseph (2007) asserts that, “It has become a necessary requirement of most employers that prospective employees must be fully knowledgeable in the use of computing technologies” (p. 21). The use of ICT in higher education has been found to improve student collaboration and engagement even though it has been argued that ICT use alone may not enhance student learning (Edwards & Bone, 2012).

The ubiquity of social networking technologies, the adoption of eLearning strategies, the growth of data-driven learning and assessment, the change from students as mere consumers to students as co-creators, and the emergence of blended learning are manifestations of key trends that are pushing the boundaries of technology use in higher education (Johnson, Adams Becker, Estrada & Freeman, 2015). Patzer (2010) asserts that distance education, an online learning programme, has been the most successful technology innovation in higher education to date. eLearning allows for increased student collaboration, it leverages the learners’ skills, makes it easy for learners to access standardised content and delivery, offers flexibility, allows for the use of multimedia technologies, and can be customised to students’ individual needs (Joseph, 2007).

The increase in eLearning may also present numerous challenges for higher education such as competition from evolving models of instruction, inadequate digital fluency of academics, the absence of rewards for teaching, and protection of education relevance, among others (Johnson et al., 2015). Patzer (2010) argues that there are numerous challenges associated with eLearning that may require programme directors to “restructure their organizations, develop new policies, train instructors, maintain a robust technology infrastructure, and offer online student services, all while they sustain the quality of online instruction” (p. 48).

- ***Learning management systems***

Findik and Ozkan (2013) explain that Learning Management Systems (LMSs) are some of the tools used for curriculum management in eLearning. LMSs are synonymous with Virtual Learning Environments (Keller, 2005). Coates, James and Baldwin (2005) have posited that LMSs are also known as course management systems, instructional management systems, content management systems or simply as learning platforms. LMS tools have been defined as platforms for collaboration, offering features such as discussion boards, online grade books, email for both academics and students, announcements, syllabi as well as chat rooms (Findik & Ozkan, 2013; Joseph, 2007). According to Lonn and Teasley (2009), LMSs are web-based

systems that enable both academics and students to share course material, submit and return course assignments, as well as allow for online communication. LMS has been defined as software that is used to plan, implement and evaluate a particular learning process (Almrashdeh, Sahari, Zin & Alsmadi, 2011). LMSs have been used to facilitate the management of teaching and learning activities in a more efficient and interactive manner, where sometimes the learning is fully online or blended.

Blackboard, Moodle, Sakai and Desire2Learn are some of the most popular LMSs in use in higher education (Spelke, 2011). These technology tools vary from one institution to another, but in many ways offer similar features such as course management, the ability to be customised for the different courses offered, and used for curriculum and pedagogical purposes. LMSs have the ability to improve communication, collaboration, incorporate multimedia, differentiate learning, and enhance teaching and learning, all of which are the affordances of using LMSs (Gautreau, 2011).

These learning platforms provide virtual spaces for interaction between academics and students, which can take the form of chat rooms, video, electronic mail and links to numerous online resources. Findik and Ozkan (2013) find that whilst the LMS offers numerous benefits for education, the decision to use LMS usually lies with academics. Coates et al. (2005) posit that LMSs are used much more in tertiary education than in secondary and primary schools. AS such, they are designed for adults who are in a position to apply self-directed learning and engagement in pedagogical activities. LMSs are designed to support different courses from different disciplines. However, the integration process usually differs based on the type of course (from applied sciences to social sciences).

2.2.3 Web 2.0 application in higher education

Social networking tools such as Twitter, Facebook, Wikis and blogs have recently seen an unprecedented uptake by individuals and institutions alike, resulting in a socially interconnected technology environment that is increasingly interactive, in comparison with the activities of listening to a lecture or watching television, which are passive in nature (Greenhow & Lewin, 2016; Lytras, Mathkour, Abdalla, Yáñez-Márquez & De Pablos, 2014). This has caused a paradigm shift in the needs, work habits, interests and expectations of the current population of students. When ICT and its impact are pervasive and ubiquitous in all aspects of our life, then it is important to reflect on our classroom needs and what goes on outside of the

classroom. Institutions should therefore try to bridge the gap between classrooms and real-world scenarios (Greenhow & Lewin, 2016).

In the last decade, there has been a growth in the popularity of Web 2.0 technologies and social media, which have significantly impacted the way in which individuals and institutions communicate (Hung & Yuen, 2010; Thomas & Thomas, 2012). Social networking tools such as Twitter, Google+, Facebook and messenger apps such as WhatsApp have become indispensable communication tools in the creation of innovative models of management education (Greenhow & Lewin, 2016; Mutula, 2013). Social networking technologies and digital media afford users flexibility, reach and immediacy (Thomas & Thomas, 2012). Social media can be used to drive conversations and topics related to current academic debates in the teaching and learning process. These discussions may be guided initially by academics, supported and monitored by the university, but managed by students. The use of these innovative online technologies could boost the online visibility of institutions as innovative, forward-thinking establishments (Thomas & Thomas, 2012).

The use of Web 2.0 technologies is hinged on the cognisance and familiarity of the inherent values that academics attribute to their integration. Academics cannot develop an interest in technologies that they are not aware of since awareness and attitude towards use are interwoven. This argument is supported by Davis (2005), who posits that “Web 2.0 is an attitude, not a technology” (p.2). These technologies now incorporate innovative applications such as interactive chatrooms, email, streaming video, and blogging tools, among others (Hawawini, 2005). These web tools have stimulated more flexible learning environments on and off campus and have made learning anytime and anywhere a reality. Whilst blended learning approaches were only available within the arenas of lifelong learning and executive education in faculties, the affordability of technology handsets has led to the rapid penetration of these technologies in educational institutions and work places (Mutula, 2013).

Alajmi (2011) explains that there is a growth in the proliferation of Web 2.0 tools in the teaching and learning practices in higher education around the world. Both academics and students alike are using web technology because of the growth in confidence in its affordances. Social media platforms such as Twitter have been reported to enhance teaching and learning by providing opportunities for academics and students to carry out discussions. This has enriched the teaching and learning process in addition to making it more effective (Menkhoff, Chay, Bengtsson, Woodard & Gan, 2015). The use of Web 2.0 technologies such as Wikis,

blogs, video sharing, Instagram, podcasting and many others have allowed not only for effective teaching, but have also ensured efficient learning in students' community (Lee & McLoughlin, 2007). Both academics and students are able to maintain the open culture of Web 2.0 that allows them to make meaningful contributions to the issues at hand, communicate, collaborate and access a variety of tools that empower them to develop and share innovative ideas.

Howe and Kekwaletswe (2012) posit that the proliferation of Web 2.0 tools affords students opportunities that not only support personalised learning, but also enhance their interaction skills, knowledge sharing, and form virtual communities with knowledgeable peers all over the world. Students are attracted to ICT tools that assist them in the creation, use and reproduction of the information content required in their academic tasks. As a result, higher education institutions, and specifically universities, are encouraging the use of Web 2.0 technologies to meet the information requirements of both academics and students (Ondieki Makori, 2012). While academics believe that web technologies significantly boost student interaction and learning, as well as their writing capabilities, some academics are still reluctant to integrate these into their classroom practice (Ajjan & Hartshorne, 2008).

An, Alon and Fuentes (2014) argue that the recent advances in ICT have altered the way in which teaching and learning take place in and beyond the classroom walls given that students are already technology savvy, more so when it comes to electronic communication and learning. Students' ability to access a wide range of ICT tools and portable gadgets such as smart phones, iPads and laptops means that they are able to read, write, edit in addition to sharing information with whomever, wherever. McCarthy (2010) avers that Web 2.0 tools expedite interactive information creation and sharing, and have the ability to bring these interactions into the classroom. The affordances of Web 2.0 technologies would ably meet the expectations of today's technologically savvy student "digital native" (Brown, 2000; Prensky, 2001). Mutula (2013) states that Web 2.0 technologies are transforming universities by giving both academics and students quick access to information and enabling a paradigm shift from textbook-based content to digital media.

The reviewed literature reveals that while academics and students are aware of the potential affordances of Web 2.0 technologies, they are oblivious of its significance in the teaching and learning process. Most studies do not show how these technologies are used in teaching and learning. Studies carried out in Europe, especially in the United Kingdom (UK), indicate that

the proliferation of Web 2.0 technologies across universities is gaining momentum because of the availability of good infrastructure and technical proficiency (Grainne, Conole & Alevizou, 2010). Studies in Canada have observed a limited use of Web 2.0 tools such as blogs (Wyld, 2008). For countries like Egypt, there is still limited use of Web 2.0 tools, even with the necessary infrastructure in place (Afifi, 2011). In the context of African higher education, numerous studies show that e-learning systems are now widespread owing to the proliferation of Web 2.0 technologies (Lwoga, 2012; Maleko et al., 2011). The enthusiasm exhibited by academics is an important step that could influence the successful integration of Web 2.0 technologies in the pedagogical practices of academics.

2.2.4 ICT integration in higher education: *change processes in HEIs*

ICT integration has been researched by a number of scholars using different variables at micro level (class level), macro level (national level), as well as meso-level (school level) (Altun, Kalayci & Avci, 2011; Peters, 2009). The integration of ICT can be examined at state level, for example, policies developed by the state and its integration efforts; at institutional level in terms of ICT integration policy efforts by higher education councils; or at departmental level or faculty level examining the integration of ICT into the instructional process. This implies that ICT integration can be studied at both micro and macro levels or using a combination of both (Altun, Kalayci & Avci, 2011). It can thus be said that ICT integration is a complex process that takes place at various levels that are interrelated, and is a process rather than a product in itself (Wang & Woo, 2007).

Lately, the focus of academic and political debates over the use of ICT has moved from classroom concerns to a more macro-economic concern in as far as redefining the higher education institution in a globalised knowledge economy is concerned (Peters, 2009). Many authors have found that new ICT is encouraging the managerial and commercial reorientation of higher education business, as well as reshaping and re-commodifying teaching and learning practices and administration in HEIs (Clegg, Hudson & Steel, 2003; Selwyn, 2007).

The emphasis and importance of ICT in higher education has continued to grow in the last few decades since it was first mentioned that the usage of ICT, such as computer technologies, would change the face of higher education learning and teaching (Mutula, 2013; McCombs, 2000). Phantasms of 'virtual-classrooms' and 'online universities' continue to be proliferated in the literature with little or no sign of abating (Findik and Ozkan 2013; Haddad, 2003). This

implies that higher education is without doubt following in the footsteps of businesses and industry into a technology-driven environment if the proponents of the ICT revolution are to be believed.

There is a feeling that ICT offers valuable tools in overcoming illiteracy given that the increased investment in technological innovations continues to enhance the services offered by higher education institutions (Amutabi, 2012; Dawson, McWilliam & Tan, 2008; Price & Kirkwood, 2013). New technologies have transformed the education sector with many practitioners looking at ICT as the best, if not the only viable alternative to ensuring that there is a meaningful interaction between teachers and students, amongst peers, and between institutions and governments. This view is shared by Saunders and Klemming (2003), who maintain that for the foreseeable future, ICT will continue to impact and alter the traditional approaches to teaching and learning, as well as the proliferation of information and knowledge.

Harris, Mishra and Koehler (2009) contend that ICT has transformed the landscape of higher education by providing lifelong learning opportunities where students all over the world are able to study at their convenience, regardless of place and time. Even those in remote areas, the disadvantaged, and disabled groups are now able to access learning through ICT. Similarly, Stahl (2008) posits that ICT has the capacity to offer flexible, customised education that is available anywhere, at any time, to anybody as well, as introducing new and different kinds of learning environments. They point out that this can be realised if governments are willing to fund and provide the resources that are needed for ICT-based innovations in higher education.

Backhouse (2013) and Haddad (2003) opine that ICT can change the way in which higher education institutions conduct their business. More specifically, ICT supports learner-centred approaches where learners can actively engage each other in the knowledge construction process, in the development of higher-order skills, and promote activities of a collaborative nature, a view that is also shared by McCombs (2000). HEIs are central to the role of producing the required human capital for countries to succeed in the knowledge economy. This view has been expressed in terms of higher education's ability to avail the labour market with technology savvy and information adept graduates. This therefore would imply that the present imperative to use ICT in HEIs is derived from and promoted by global economic matters (Larsen & Vincent-Lancrin, 2005; Peters, 2009).

In the 21st century, the emphasis is on developing graduates who are information literate and this is seen as the longevity and survival of higher education and the growth of a ‘postmodern university’. The importance of technological innovations in HEIs for both developing and developed countries ought to be recognised. In this vein, there seems to be several efforts around the world to effectively use ICT as a tool to enhance teaching and learning, especially at HEIs (Alkhafaf et al., 2012; Backhouse, 2013; Fillion et al., 2012; Saleem, Mustafa, Bajwa, Qureshi & Hijazi, 2011).

The widespread acceptance of ICT in higher education institutions since the mid-1990s has not yielded the much-anticipated changes in teaching and learning that many expected (Phillips, 2005). Research by Cuban et al. (2001) suggests that the impact of ICT has not measured up to the rhetoric that it would produce radical changes in teaching and learning. This has created an environment of disappointment in the sense that the envisaged potential of ICT transformation is being missed, or worse, resisted (Al-Senaidi, Lin & Poirot, 2009). In many parts of the world, ICT in higher education has made impressive advancement and is now used in many areas for various purposes, especially in higher education institutions, ranging from high-level decision making (Phillips, 2005) to course evaluation schemes (Ward & Parr, 2010). Without prejudging what the enthusiasts said should be happening, ICT can be seen as an enabler in higher education with many governments now accepting the practice of integrating ICT into educational processes (Schneckenberg, 2009).

The comparative advantage of using ICT in education has been widely researched for many years now (Bhasin, 2012; Donnelly, McGarr & O'Reilly, 2011; Fernando, 2012; Pelgrum, 2001; Stahl, 2008). The researchers' interest in all these studies lay in pointing out that ICT usage has a comparative advantage over traditional classroom practices. While the use of ICT in higher education has been well documented, not much evidence is available to describe exactly what goes on in the ICT environment and its social cultural context.

Although institutions and faculties boast about technological integration contributing to institutional effectiveness and transforming learning, in reality, not much has been done to integrate ICT into practice (Bober, 2002; Pelgrum, 2001). This raises pertinent questions such as, is it necessary to integrate ICT into academic practice? Are there successful models for ICT integration projects? What are some of the inhibitors of ICT integration into academic practice?

2.2.5 The changing face of teaching and learning

ICT has transformed the way in which academicians teach and students learn. Many faculties have changed the information flow from the face-to-face mode to an entirely online mode, and courses have been redesigned and curricula offered completely online (Amin, 2016). Others have developed a hybrid or blended mode of delivery (Fillion et al., 2012). Altogether, new methods of knowledge creation, consolidation, and sharing have been established in order to satisfy the rapidly evolving needs of a mass of individuals in search of more knowledge.

Many aspects of HEIs, ranging from administrative processes to academic functions such as classroom instruction, are supported by technology today (Price & Kirkwood, 2013). However, it is apparent that support systems have kept a better pace with technological advances than classroom technologies in terms of curriculum integration (Georgina & Olson, 2008; Monahan, 2008). Findings from the United States indicate that many institutions of higher education view ICT integration as encompassing the convergence of the traditional technology of the institution campus administrative systems, such as student information, finance, human resources, and fundraising systems with the emerging technologies of online, flexible learning (Taylor, 2003).

In some instances, faculties have been able to redesign what they do and how they do it, although the effort has been negligible (Falconer & Littlejohn, 2007; Kukulska-Hulme, 2012). While some success has been achieved in the integration of ICT into the classroom, the impact has not yet been fully felt. It is important to note that although technological use in education is altering the education landscape, the changes are rather slow (Agbonlahor, 2006). There is a need for faculties to re-examine the curriculum in terms of what they teach and how they teach it if they are to integrate ICT into their practice (John & Sutherland, 2004; Miller, 2000; Tondeur, van Braak & Valcke, 2007). It is also worth noting that some faculties are opposed to curriculum review, but at the same time the proponents of ICT integration argue that those opposed to it are not yet prepared to accept the challenges brought about by the introduction of ICT (Njenga & Fourie, 2010).

Researchers argue that the effectiveness of ICT usage is entrenched in a more encompassing process of school change (Mumtaz, 2000a; Sang, Valcke, Braak & Tondeur, 2010; Vandeyar, 2006); and that ICT application efforts ought to be assessed along with other school reforms other than in isolation. Similarly, Balanskat et al. (2006) opine that the effective integration of

ICT in pedagogy will only be felt in student learning if it is rooted in a more encompassing process of school change. When examining the effects of ICT on education, it is better to look at the school level variable other than single unit analysis since inconsistencies have been reported in earlier studies (Mumtaz, 2000) emanating from the disregard of the different schooling levels.

By realising ICT's effect on the workplace and everyday life, educational institutions today can streamline their courses and classroom facilities so as to narrow the prevailing technology gap in their pedagogies (Tomei, 2005). This transformation process will require the effective integration of ICT into the existing educational environment if students are to be equipped with subject specific knowledge in addition to promoting professional productivity and constructive engagements (Khasawneh & Ibrahim, 2012; Shaikh, 2009; Tomei, 2005).

The sole application of new technology in higher education is unlikely to change the face of teaching and learning (Bingimlas, 2009a; Cuban et al., 2001), however, education can be enriched when innovative practices take into consideration the characteristics of technology, as well as the pedagogical design within the context of the learning environment. The characteristics of the student, prior experience, and acquaintance with ICT tools should also be considered (Georgina & Olson, 2008; Nguyen, Williams, Nguyen & Model, 2012). Even though ICT is credited for enabling new teaching and learning approaches, there is no guarantee that effective and appropriate learning outcomes will be achieved. ICT on its own is not enough, but educational purposes must provide the lead and it is important that students understand not only how to work with these technologies, but also how these can be beneficial to them (Fong et al., 2014; Georgina & Olson, 2008).

ICT is challenging the traditional ways of teaching and learning that, for a long time, were compartmentalised into formal, non-formal and informal slots. Not long ago it was not perceivable that learning could take place outside of public spaces. Barron (2006) suggests that while students can learn differently in informal and formal settings, learning is not confined to certain boundaries. While learners will opt for a learning form already learned from formal settings, they will often supplement these with approaches that are from the informal setup. This is in line with Greenhow and Robelia's (2009) argument that adopting the learning ecology approach requires a cultural shift.

Higher Education is still trapped in a time warp where instructional information is mostly transmitted by word of mouth (Blin & Munro, 2008). Many have argued that computers have changed life, but they still have not disrupted the dominance of the lecture as the predominant mode of instruction in higher education (Haddad, 2003; Saunders & Klemming, 2003; Taber, 2011). The physical structure of the average classroom may still incorporate overhead projectors and there may be Video Cassette Recorders (VCRs), but modern technological learning tools are not often used (Miller, 2000).

2.2.6 Success and beliefs related to ICT integration in HEIs - *Can ICT help meet the educational requirements of the digital era?*

The rising number of non-traditional and lifelong learners has required a number of countries to make considerable efforts towards the provision of higher education and also to accommodate the regular-age cohorts. This kind of expansion, however, cannot be sustained by the traditional models of education provision that have been used in many countries, more so in the context of limited public funding. This has ignited a need to find more versatile and cost-effective ways that can meet tertiary education needs. ICT mediated education has thus become pivotal in the expansion and delivery of higher education in many parts of the world, specifically in the period since the 1990s, which has witnessed a rise in advancements in ICT. The integration of ICT in higher education presents various opportunities to education organisations across the world that are still failing to address growing and changing student needs (Guri-Rosenblit et al., 2007).

The adoption and integration of ICT facilities into institutions of higher education have opened a new mien to globalisation in education, and the usage of internet technology is steadily growing in both developed and developing nations. This is true, especially when institutions see a need for internet access and a web portal implementation that is intended to facilitate the institution in carrying out most of its activities ubiquitously (Chong, 2006; Eynon, 2008; Löfström & Nevgi, 2007; Sim & Hew, 2010). Governments in both developed and developing countries have realised that ICT plays a vital role and is key to the future of education systems and have produced national policies on ICT in support of the use and integration of ICT into education curricula (Reffell & Whitworth, 2002; Vandeyar, 2006).

From the educational perspective, the importance of ICT is quite evident, although chalkboards, textbooks, radio, television and film have been prevalent over the years for

educational purposes, their impact on the education process has not been felt like that of the computer. ICT is credited with the ability to offer users with more interactions as they develop their cognitive abilities (Christie & Garrote Jurado, 2011).

Many faculties think primarily about content when considering ICT integration in institutions of higher learning. ICT is viewed in terms of its ability to capture, manipulate, store, and disseminate pedagogical content, or its ability to locate and retrieve resources that are spread across different networks. Some view ICT primarily as a means of communication that can facilitate discussions that are either synchronous or asynchronous in nature. These two perspectives can be compared to general conceptions of teaching in which the teaching process is viewed as either teacher-centred or learner-centred (Kember & Kwan, 2000). Thus, the faculties' use of technology is influenced by their conception of their teaching role.

The potential of ICT to transform instruction in universities has long been celebrated by education technologists. Research carried out in this area has often focused on the potential of ICT to accelerate students' understanding, augment and communise access to educational opportunities and support collaborations as well as interactions (Backhouse, 2013; Bhasin, 2012; Stahl, 2008). The influence of ICT on teaching and learning in the 21st century has, and continues to revolutionise and reinvigorate the higher education sector. Education technologists continue to make ultimatums that institutions of higher learning must embrace the change or perish in light of technological innovations (Lau & Bates, 2004).

Huge investments, usually to the tune of billions of dollars, invested in technology for higher education in both the developed and developing world show the unerring faith that many universities and technology enthusiasts have in ICT's potential to alter the ways in which teaching and learning are conducted (Hong & Songan, 2011; Phillips, 2005). Apart from technology-enabled distance education, funding is also meant for the use of ICT on university campuses; moreover, these investments emphasise and are meant to build technology infrastructure. Many higher learning institutions continue to make attempts to integrate instructional technologies into the conventional forms of teaching and learning. In addition to student self-learning, the proliferation of online learning and teaching tools, like Moodle and Blackboard, has motivated many institutions of higher education, especially universities, to move away from the traditional teaching and learning methods that rely on face-to-face interactions (Balanskat et al., 2006; Fry & Love, 2011). Increasingly today, ICT continues to be regarded as a symbol of the 21st century for education provision at universities and other

higher education institutions, both in developing and developed countries (John & Sutherland, 2004; Mumtaz, 2000a).

Many higher education institutions are positioning ICT as key to teaching and learning by continuously investing in tools that will make this possible, even when many students and academics hardly make use of ICT for educational purposes (Draper, 2010; Mumtaz, 2006; Selwyn, 2007). The actual formal use of ICT at universities differs from one institution to another and from course to course, even within institutions (Selwyn, 2007). Classroom use of these technologies is often seen as a luxury and out of reach for many institutions, especially in developing countries like Uganda (Adam, 2003). Technology use in higher education has been referred to as rutted, infrequent, as well as low-level and, as such, some commentators have been tempted to deny its role in higher education by stating that it is nothing more than a fuss. As a result, there has been a reluctance by both faculties and students to make use of ICT sustainably (Reffell & Whitworth, 2002).

Africa has not done very well in as far as the adoption of ICT in universities and colleges is concerned. Those who have had the funds to do so have embraced ICT enthusiastically by setting up their corporate IT departments, while others who have lacked the resources have opted for a piece meal add-on approach. ICT in many African universities has not yielded much results and has remained as poorly maintained computers and networks that are constrained by low bandwidth connections and network failure (Adam, 2003). For some universities in South Africa, Egypt, Uganda, Ghana and many others, progress has been made in applying ICT, although integrating ICT into higher education is still complex (Adam, 2003; Farrell, 2007).

The role played by ICT in higher institutions of education is growing and is bound to grow for the foreseeable future. According to Oliver (2002), other fields such as banking, travel, business, architecture, engineering, medicine, leisure, and tourism have had a tremendous change in the last years and this has been attributed to ICT. However, the same cannot be said for education as it has been very slow in terms of initiating ICT changes. The author further notes that not long from now, those in the field of education will be able to take advantage of the opportunities afforded by ICT, increasingly so as there has been a shift from the traditional education practices of chalk-and-board and textbooks as delivery modes to more ICT mediated delivery approaches that address competence, performance, and are more flexible.

2.3 ICT Policies in HEIs

The role played by ICT in academia is fast becoming one of the most debated areas in modern education policy. Many scholars in the education field are in agreement that, when technology is used well, it has the potential to improve pedagogy in addition to shaping opportunities in the workforce. Countries the world over today regard ICT skills acquisition as part of basic education, together with numeracy, reading, and writing (Amutabi, 2012). Academicians are increasingly playing a big role in the development, adoption and implementation of educational innovation each day that passes; their role is fundamental in the integration of ICT into the education curriculum of any country. Scholars have alluded to the fact that ICT skills improve human resource capacity not only in areas such as business processes, industrial operations and educational programmes, but in almost all aspects of life (Archibong et al., 2010).

2.3.1 Rationale for ICT policies in higher education

Numerous views have been advanced by different stakeholders in both developing and developed countries for the continued use of ICT in the educational realm (Agbonlahor, 2006; Cross & Adam, 2007). At policy level, just like numeracy and literacy, ICT is now a prerequisite skill for the 21st century workforce (UNESCO, 2006). ICT offers opportunities to improve pedagogy and it increases the chance and rate of employability (OECD, 2001).

Countries generally use four rationales for ICT policy formulation to justify the introduction of ICT in schools (Hawkridge, 1990). The strongest reason is the social rationale that underscores the role of ICT in society and spurs its integration into schools. Secondly, there is the vocational rationale that is geared at equipping learners for future work place employment. Thirdly, there is the pedagogical rationale, which posits that ICT in schools will go a long way in improving teaching and learning. Lastly, there is the catalytic rationale, which suggests that the introduction of ICT will improve teaching, administrative and managerial efficiency. According to Plomp and Pelgrum (1993), no single rationale is sufficient to guide policy makers, but rather a combination of rationales will determine the nature of the implementation strategies developed and carried out.

National ICT policies permit for the coordination of a country's educational goals. The importance of ICT policies has been argued by many authors (Kozma, 2008; Tondeur et al., 2008; Vandeyar, 2006). These policies are significant in that they provide rationale, goals and

direction on how countries' education systems may be influenced when ICT is introduced. They also highlight the different ways in which academics, learners, parents and other stakeholders can gain from ICT integration in educational settings (Kozma, 2008). Whilst innovations within classrooms may ensue, regardless of whether there is a national policy in place, their sustainability cannot be guaranteed without referring to at least one of the four rationales, specifically: to promote social development; to support economic growth; ICT to support educational management; and to advance education reform.

Kozma (2008) argues that the policy rationales complement each other and are by no means exclusive. These rationales reinforce each other in many countries, for example, South Africa uses two or more rationales. There is a need for operational and strategic policies to be aligned with national ICT policies if these are to be effective. There is also an urgent need for the rationales and goals of particular ICT initiatives and projects to be closely linked to national rationales and goals to foster ICT in instruction. Additionally, for ICT policies to be effective, they must be aligned with other policies that are in place within the educational context, which is known as 'horizontal alignment'. Also, national policies should be aligned with regional policies.

Similarly, studies on ICT usage in educational institutions in the UK, Australia, Belgium, the Netherlands and the USA have highlighted the lack of elaborate national ICT policies that are coherent and cohesive with institutional policies (Bryderup et al., 2009; Reid, 2002). Reid (2002) highlights the importance that has been attached to ICT use in many institutions in higher education in Europe, but notes that although ICT's role was commendable, many of the activities were not aligned with the institutional frameworks in which they were occurring, yet policies are important in universities and HEIs today if they are to compete favourably with other HEIs in the market by boosting learner-centred education, as well as demands by staff and students to access educational technologies.

Singapore and Japan have seen consistent and focused policy initiatives directed at curricula, infrastructure, professional development and support for the larger part of the last millennium. These efforts were meant to boost ICT adoption for lifelong learning. Japan's national ICT policies and practices, as described by Sakayauchi et al. (2009) and Shimizu et al. (2003), have been indicative of unwavering efforts directed at curriculum reforms through the incorporation of new inter-disciplinary courses. There has been growing support for ICT integration in

schools in an effort to support lifelong learning beyond the confines of the classroom walls (OECD, 2001).

Elsewhere, like in the UK, ICT is envisaged to alter the current teaching models as well as the role of academia (JISC, 2003). ICT now extends its reach to mainstream education in terms of educational policy and, currently, a number of agreed e-learning strategies by the Higher Education Funding Council for England (HEFCE, 2005) and the Department for Education and Skills, (DfES, 2005) are in place. Although the UK has had various policy initiatives and practices related to ICT integration in education (Grainne Conole, Smith & White, 2007), these efforts have been geared at ensuring that ICT is integrated within the courses as well as the course selection process, allowing students to make informed decisions. The government has also made propositions regarding the need to have strong linkages between commercial and educational markets (Grainne Conole et al., 2007). The outcome of swift technological advancement and the rhetoric that dominates policy is the on-going but mysterious suggestion that technology can transform the way in which we teach and learn. This can lead to ill-starred decisions, for example, the collapse of the much promoted UK e-learning universities worldwide limited (UKeU) (Grainne Conole et al., 2007).

2.3.2 Policies and practices for ICT adoption in higher education

Kearns, Global Learning Services Pty Ltd (Australia) and the Australia. Dept of Education, Science and Training (2002) argue that many developed countries have made considerable progress in implementing ICT education policies. In a comparative study of ten countries, Kearns et al. (2002) noted that Sweden and the United States of America were in the advanced phases of their national plan for ICT in education and were in the process of starting on their third phase of policy implementation. The findings also indicate that none of the surveyed countries had fully implemented all stages of policy implementation. Moreover, it was shown that countries were largely challenged by the rapid pace of technological, social and economic change and were not certain of how to best deal with it. Kearns et al. (2002) indicate that the current requirements of a dynamic knowledge society necessitates governments to rethink their traditional policy approaches to government processes, mechanisms, as well as initiatives for them to remain relevant in the information age.

The education policy and investment programmes geared at promoting digital literacy have received considerable support by countries such as Denmark and Norway (Ottestad, 2010).

However, there have been reports of changes in educational policy, especially in Denmark where the interest is now high for test and subject-related issues, thus substituting policy orientated policies. Principals in Denmark have reported that this change has accounted for the decline in reform orientated practices (Bryderup, Larson & Trentel, 2009). The ICT integration efforts put in place by Denmark through the relevant education policies have been geared at understanding how ICT integration can enhance the development of curriculum subjects and, as such, they are determined to deepen knowledge rather than simply creating knowledge based on the UNESCO (2008) definition thereof. Examinations and tests have for many years been regarded as a measure of attaining high academic standards (Danish Ministry of Education, 2007).

Numerous competing policies and strategies have also been identified in Norway (Ottestad, 2010). There has been a push for digital literacy with efforts made to leverage ICT with the aim of creating new and better approaches to learning and assessment. Additionally, emphasis has been placed on lifelong learning without negating the significance of assessment through tests and examinations. The competing policies both in Norway and Denmark seem to have imposed demands on educationalists who may not be eager to adopt lifelong learning practices as a result (Bryderup et al., 2009; Ottestad, 2010).

Many African countries have national ICT policies, although many are not ratified (Kearns et al., 2002). Africa is still plagued by numerous inhibiting factors that are characteristic of third world countries and therefore face many problems when implementing ICT policies (van Reijswoud, 2009). There is a need for educational reforms if Africa is to keep pace with the technological changes in order to meet the needs of the 21st century learner (Pheeraphan, 2013).

Howie (2010) reports that debates on ICT policies and practices in education have largely been carried out in developed economies that are well-resourced. ICT presents distinct challenges in the education sector of developing countries such as South Africa, which require thoughtful deliberations owing to the fact that large sums of money are required for investment in instructional technology. In countries where the resource envelop is small and there are a number of competing demands, policies ought to provide direction on how ICT investment can enhance education, social, as well as economic development (Kozma, 2008). ICT investments should be cautiously selected, monitored and controlled so as to allow policy makers arrive at informed decisions that will help them in refining policies if the need arises. It is also important

that monitoring and evaluation programmes are instituted as part of the efforts to ensure that students, institutions, communities and the economy in general benefit from ICT policies.

2.3.3 ICT policy challenges

There are numerous debates among scholars and practitioners highlighting the transformation potential of ICT in the educational sector. These changes can be in the form of wider organisational transformations, take, for example, the establishment of mega-universities (Keane, Keane, & Blicblau, 2016; Tusubira et al., 2007), or it could be a product of competition in the global educational environment (Guri-Rosenblit et al., 2007). There are those that have not been very specific but they envisage a linkage between ICT and the changes in the educational landscape that have given rise to more flexible learning opportunities (De Boer & Collis, 2005). Evidently, ICT is concomitant with the paradigm shift in educational practice, but this kind of relationship is multifaceted and disputed. Perhaps this is because the identities of academics are shaped by the institutions and disciplines in which they engage, and the values they hold, all of which have had to change in light of successive policies such as massification, which has continued to reshape higher education (Clegg et al., 2003). The relationship between the state and HEIs is changing, especially in terms of funding allocations and the ensuing re-positioning of higher education as a competitive market. All of this has an effect on higher education practices (Henkel, 2005).

One of the key lessons that has emerged from this literature review is that policy (particularly with funding) profoundly and radically impacts practice. Time shows that unfortunately, there has been too much evidence of knee-jerk policy, which does not take into account the evidence emerging from research (the collapse of the UKeU is the most publicly visible example of this). There is a need to set in place formative assessment mechanisms alongside initiatives so that individuals and the sector as a whole can reflect on initiatives and filter recommendations for future direction (Grainne Conole et al., 2007).

In many Asian and European countries, the policy rhetoric has focused on the need for the education systems in these countries to groom students for lifelong learning if they are to meet the challenges of the 21st century, such as globalisation (Law, Lee & Chan, 2010). Discrepancies have been reported between existing policies and changes in instructional practice that these policies are meant to influence. Many times, the policies are pronounced but academics are unaware of their intention or goal, or even the specific details of the policy.

Faculties ought to engage in content-specific professional development programmes that are aligned with existing policy. Additionally, Kozma (2008) argues that it is important for countries to consider public-private partnerships if they are to effectively implement policy, as evidenced in the South African e-education policy.

Other than the lack of clearly defined ICT policy documents and instruments, the literature shows that policy implementation trends the world over are inclined to respond to global drivers, especially the knowledge economy and ICT, usually at the expense of institutional and national interests (Cross & Adam, 2007; Sakayauchi et al., 2009). These findings are also supported by the works of Chong (2006). In South Africa, just like in other parts of the world, contextual complexities have played a major role in hindering the integration of ICT in higher education. In the post-Apartheid era, the National Commission on Higher Education (NCHE) was involved in numerous reforms to cater to equal access and equity, increased cooperation and partnership, as well as responsiveness in the higher education system. However, while major reforms were made in higher education, the place of ICT was unclear, and there was no mention of ICT as a possible means to expanding access and analysing key policy issues. Despite ICT being well received at different policy levels in the South African government, this effort did not translate into the same thrust in higher education (Cross & Adam, 2007; Vandeyar, 2006).

In reviewing policy and funding arrangements, one thing is certain. Research is inclined to follow policy directives and technological advancement rather than informing them. For example, the concept of re-usable learning modules was of little interest until controlled vocabularies and information architecture arose from the technical end of learning technology work. Equally, the networked learning movement, which is so visible and is a productive avenue of research, did not exist until internet development supported asynchronous communication. This is now seen as a vehicle for developing learning depositories (Littlejohn, 2002).

Cross and Adam (2007) assert that many HEIs in Africa confront internal and external problems in the course of integrating ICT because many African governments lack national ICT policies. This forces many universities to perform their functions without a coordinating document. This argument is also supported by Blignaut and Howie (2009), who note that although these devices were essential in teaching and learning, their penetration was low, especially in the developing nations such as Africa, this was again attributed to the lack of

policies in many African nations. The study showed Uganda, Ghana, Tanzania, and Mozambique as some of the countries where universities had home pages describing courses, faculties, as well as admission criteria. It was noted that the probable solution to mass higher education lay in the use of ICT-based learning provided that investments are made in hardware and software and that the technologies are properly mastered (Agbonlahor, 2006). Similarly, in developing countries such as those in Africa, issues of bandwidth were raised as major stumbling blocks. It was further noted that ICT integration was sometimes difficult because academics and decision makers were reluctant to change pedagogical as well as curricular approaches (Mtebe, Mbwilo & Kissaka, 2016; Tusubira et al., 2007).

Many ICT policies and strategies for both virtual and on-campus-based education are now more technology-driven, and emphasis has been placed on developing the technological infrastructure without attaching importance to the underlying pedagogy. Zemsky and Massy (2004) aver that whilst LMSs (such as WebCT, Moodle and blackboard) have been embraced by universities, there has been no fundamental change in the pedagogical practices of academics since ICT has been predominantly used in supplementing existing teaching practices. Similarly, Collis and Wende (2002) conducted an international survey and concluded that there was a lot to be desired in terms of harnessing technology to improve teaching and learning.

In many dedicated distance education universities, effort has been made to get students online to support teaching, learning, as well as administration (Fry & Love, 2011). Web-based technologies have played a major role in providing numerous ways to remedy the absence of interpersonal communications, which has been ‘the Achilles heel of distance education’ (Guri-Rosenblit, 2005). While interpersonal communications enrich the educational experience of independent distance learners, there are deep-seated problems with current educational practices. Many existing policies and practices are poorly crafted and seem to indicate that ICT is not streamlined with other organisational functions, and does not address the identified challenges (Guri-Rosenblit, 2005).

HEIs are putting more emphasis on training a knowledgeable and skilled workforce as they position themselves to compete favourably in a knowledge economy (Peters, 2009). Many world economies realise that HEIs are instrumental and play a pivotal role in the globalised world. The growing shift to high technology and information technology economies requires continued human resource development and training. Universities realise that unless they

incorporate ICT in their core functions, they may not be able to compete (Sarkar, 2012). In their quest to create qualified human resources, universities are compelled to be innovative and take on leading roles in the usage of cutting-edge technology in order to meet these expectations. Similarly, HEIs should be accessible, effective, as well as efficient, especially when governments are counting on university graduates to be competitive in wealth creation for their respective countries (Sarkar, 2012).

The historically rooted cultural features of HEIs are now challenged by globalisation. Their relationship with national polity, culture and economy is also challenged by the same process. HEIs are called upon to take on new tasks and social, economic and political demands in the age of globalisation. These additional tasks consequently impact their legitimacy, governance structures, academics' life culture and work, as well as organisational arrangements (Gumpert, 2000).

As such, HEIs are therefore deeply infused with values derived from the historical pattern of foundation, which has largely remained unchanged up until recently (Fry & Love, 2011; Gumpert, 2000). Similar structural and historical features of HEIs are embedded in national regulative political and governance systems, which shape their structural and organisational features. The deep institutional changes witnessed in higher education involves the de-institutionalisation of rooted policy and value frameworks and the parallelisation of new ones (Vaira, 2004).

The adoption of ICT in education has not replaced classroom-based modes of learning and teaching. ICT can offer better access for different target learners, and has become a medium for enriched pedagogical experiences, especially for learners and educators that are geographically dispersed or in different time zones (Van Dusen, 2014). This calls for positive ICT policies and investments that will clearly benefit HEIs. The coordinated implementation of revised or new policies will most likely necessitate the involvement of other stakeholder ministries such as telecommunications, as well as national private and non-governmental education boards and agencies (for accreditation and recognition where applicable) (UNESCO, 2006).

Numerous initiatives over the last decade have focused on the development and adoption of ICT in education, resulting in significant changes within HEIs; increased uptake and use of ICT impact on policy and strategy within institutions, as well as impacting organisational

structures and roles. However, despite this, the increased use of ICT has raised many new questions and issues, one of the most fundamental is: given the interconnection of policy directives and the subsequent impact on practice, what factors need to be taken into account to make appropriately informed policy decisions? (Conole et al., 2007).

This section has established that there are a number of challenges that lie in the path of ICT policy formulation and implementation in higher education. As discussed in the previous sections, in looking at the structure of ICT at the national policy level in many countries, including where ICT is used in the larger student context of higher education life, we can deduce a pattern, which implies that the use of ICT in higher education is fashioned in a restricted, rigid and linear way that is far removed from the empowering, productive and creative applications which proponents of education have often supported (Bober, 2002; Lim, 2007; Lloyd, 2005; Ward & Parr, 2010).

2.4 International Perspectives: ICT Integration in Higher Education Institutions

2.4.1 Developed countries context

The increased investment in computing resources and a surge in internet-based technologies demonstrates the amplified use of ICT in higher education institutions (Hong & Songan, 2011). The growth of online instructional resources and administrative functions, all of which are provided by internet technologies, suggest that there is a need for scholars and practitioners alike to rethink their approaches to higher education. The importance that is attached to lifelong learning and the quality of teaching demands changes in organisational policies that call for the need to adopt ICT in instructional delivery (Bryderup et al., 2009). Such developments are bound to alter the way in which teaching and learning takes place, both inside and outside the classroom. Numerous demands have accrued as a result of new innovative technologies that call for educators to revisit their roles and practices to accommodate learning and teaching approaches that are not only more flexible, but also cost effective in terms of the delivery of higher education in an environment that is increasingly competitive (Preston et al., 2010; Wake, Dysthe & Mjelstad, 2007).

The increasing interest and attention given to ICT in the last decade has resulted in continued investment in the use of ICT in education all over the world (Jankowska, 2004; Sanyal, 2001).

Many institutions have witnessed exponential growth in ICT usage, for example, the US has seen exponential growth in higher education mediated by technology (Parker, Lenhart & Moore, 2011). Similar scenarios have been replicated all over Europe, especially in the UK, the Netherlands, and Finland (Larsen & Vincent-Lancrin, 2005). In China, the growth of the Chinese economy has necessitated a fundamental change of pedagogy and education philosophy. Thus, the transformation of teaching facilities, pedagogical content and curriculum design was initiated by the government. Virtual campuses were created in many HEIs from the mid-1990s (Hu & Webb, 2009), thus, it is not surprising that ICT has made an impact on society and on our daily lives. In addition to the investment in ICT for instruction, the growth and spread of the knowledge economy has played a significant role in attracting attention and emphasis on ICT usage in education (Yuen et al., 2003).

A number of countries have developed master plans that incorporate educational innovations. Such plans embed a broader framework for reforms in the education sector that are intended to develop new ways in which students can self-learn, communicate, engage in problem solving, critical thinking and analysis, collaborate and learn, as well as seek information, which were less emphasised in previous school curricula (Amin, 2016; Pelgrum, 2001).

2.4.1.1 Teaching and Learning in higher education

Since computers were introduced in the classroom about 20 years ago (Spector, Merrill, Elen & Bishop, 2014), a number of changes have been realised. New concepts such as ‘networked learning’ in the UK, ‘distributed learning’ in North America, and ‘flexible learning’ in Australia have taken root (Bates, 2001). Learners are now taking advantage of the opportunities offered by ICT to access quality teaching and learning at their convenience without the constraints of time and space. The use of well-designed multimedia learning materials to enhance the learning environment, as well as team teaching all result from the use of ICT over traditional classroom practices, which has been observed more often in higher education (Redmond, 2011). These benefits can only be realised when ICT is effectively integrated into teaching practice. The integration of ICT into educational pedagogy has long been a subject of debate by academics (Thomas & Thomas, 2012).

According to Lindblom Ylännne, Trigwell, Nevgi and Ashwin (2006), the education sector has witnessed an increase in the number of international students, especially in economically advanced nations like the USA, Australia, the UK, New Zealand, Canada and many others in

the last decade. This huge enrolment is as a result of the diversification of student populations with the majority now coming from lower social backgrounds. This is attributed largely to the growth of part-time students (Stricker, Weibel & Wissmath, 2011). The Observatory on Borderless Higher Education (OBHE) estimates that by the year 2020, the global enrolment in higher education will have reached 125 million, of which 5.8 million will be international students. This is in comparison to the total enrolment number of 100 million in 2006 in higher education (Kirkwood & Price, 2013).

Peters (2009) asserts that international part-time learners expect different facilities and services from those offered by traditional elitist school leavers. They envisage a more flexible, learner-centred teaching process as many would only be in a position to enrol in distance education. Some reviewers argue that there is a fundamental difference between the current and previous generations of students in terms of learning styles and how knowledge and information being accessed (Clegg et al., 2003; Prensky, 2003). This view is also shared by Allen and Seaman (2010), who believe that technology should be widely used in teaching and learning, and therefore HEIs should respond to these changes to accommodate the different learning styles.

The potential of digital technology lies in its capability to support more interactive and communicative processes, and facilitate participatory pedagogy by supporting a multiplicity of communications (Harris et al., 2009; Plomp & Voogt, 2009). It should be noted that the phenomenal growth of technology mediated learning, for example, online courses in the last decade is as a result of the increase in demand for education. In the US alone, there was an increase of more than three quarters (77%) in the year 2011 in terms of universities and colleges that offered online classes (Parker et al., 2011). This is also evident in the earlier findings of Allen and Seaman (2010), which show an increase of 21% enrolment in online courses between 2008 and 2009 in higher education institutions in the US. Much as the technology is changing the traditional teaching and learning landscape in many parts of the world, technology does not necessarily support active learning. This largely depends on how technology is blended in the design of online courses. In many technology mediated courses, for example, ICT plays the role of enhancing the delivery of online lectures (Hamilton & Feenberg, 2005).

The UK, US and other developed countries have made numerous efforts to integrate ICT into pedagogy at HEIs in the 20th century. (Allen & Seaman, 2010; Bhasin, 2012; Browne, Jenkins

& Walker, 2006). The review of technology adoption in American classrooms dates back to the 1920s, and in many other countries like the UK, bodies such as the British Universities Film Council were established to promote the use of film in university teaching and research (Chen, 2010). The UK government launched the Teaching and Learning Technologies programme (TLTP), which was aimed at promoting the creation and use of digital content as well as other resources in higher education. Although these programmes were meant to use ICT to enhance teaching and learning, they did not systematically address the pedagogical issues that came with it (Phillips, 2005).

In the US, the development of the web was seen as a catalyst for the growth of distance education. The findings of the Institute of Higher Education policy indicate that ICT was not considered as a major factor when compared to other issues such as learner characteristics, learning tasks and student motivation (Jaggars & Bailey, 2010). Elsewhere, in Australia, the government funded similar programmes just like in the UK with the objective of sharing software and best practices from the development process throughout the higher education sector. The findings from the evaluation of the programme indicated that the use of a particular technology was not in itself solely responsible for improving the quality of learning or learning outcomes, but rather a combination of factors were pointed to as indispensable for a successful project outcome, with students' learning experiences being the most critical (McPhee & Söderström, 2012).

ICT has also enabled collaboration among self-directed HEIs from around the world, and academic coalitions have been formed to reinforce the position of HEIs in the educational market place. For instance, unique learning partnerships have been created between the USA and UK with over 11 autonomous universities forming alliances with the aim of offering high quality online courses (Carr, 2000).

The research also suggests that the integration of ICT has not been a smooth and problem-free process in the developed world. The Observatory on Borderless Higher Education (The Observatory, 2002) report indicates that even though faculties were enthusiastic about new technology mediated delivery approaches in teaching and learning, it was established that only a handful of participating institutions had been able to integrate vital web-based learning components into organisation-wide online learning (Garrett, 2003). These findings show that there is a lacuna in the way in which ICT is integrated into higher education, specifically academics' practices, services and strategies and this calls for new ways of integrating ICT

into the existing curriculum.

Similarly, in Australia, the Yetton report (1997) highlighted six major issues that HEIs ought to address when studying ICT-based plans as a foundation for creating a niche in higher education markets. These issues were: the necessity to improve the quality of teaching; cost reduction; the desire to facilitate multiple new campuses; the varying profile of the student base; competition for students; and inter-university collaboration. The Australian government put in place mechanisms to equip universities with ICT through different initiatives and the funding of innovative practices through professional development programmes at different universities. In turn, this would identify the shortcomings of conventional practice that emphasises rewarding efforts from academic staff based on research initiatives with little or no instruction skills developed in the new setting using ICT (Price, 2005).

Debates on ICT integration in HEIs in the Netherlands reveal the importance that is attached to the relevant infrastructure and how institutions have moved beyond the exploration phase of the affordances offered by ICT. This has created an environment that allows institutions to make use of ICT in their efforts to improve teaching and learning. These innovations by Dutch institutions are directed at promoting flexibility, problem based/learner-centred education, and competence-based learning (Valcke, 2004; Verkroost, Meijerink, Lintsen & Veen, 2008).

These and many others are some of the changes that are taking place in HEIs in developed countries. Whilst the prevalence of literature focusing on developed countries may give the impression that progressions in well-off countries is more universal than in developing countries, developing countries such as South Africa, Singapore, Malaysia, Chile, India, and China have also taken various initiatives to ensure that ICT is integrated into higher education practices (Ali, 2012; Howie, 2010; Hu & Webb, 2009).

2.4.1.2 Changing and adapting roles in higher education

The roles and tasks of faculties in higher education are increasingly influenced by the emergence of new and innovative digital technologies that significantly alter the way in which digital content is delivered, as well as strategic partnerships. In the context of higher education, two dimensions of the changing roles are evident: the traditional campus and the virtual campus (Altbach et al., 2009). The advances in internet technology and the digital publishing of information resources has mainly impacted the culture of residential universities that has relied heavily on textbook information. HEIs are increasingly finding it difficult to do away

with over seven centuries of conventional face-to-face lecturing. Although the lecturing method is widely accepted, it may not be the best approach to teaching and learning in the prevalence of new digital technologies that support synchronous communication (Altbach et al., 2009).

Digital technologies are now making it possible to create interactive multimedia content for lectures that were previously depicted as being passive and non-interactive, making it possible for both academics and students to interact with each other without unsettling the delivery of content within an instructional session (Altbach et al., 2009). ICT has made it possible for academics to facilitate various courses without the need to be physically present in the lecture hall. Classroom sessions can be digitally recorded and replayed at a later date by learners, a practice that allows for personalised learning (McLoughlin & Lee, 2010).

Academics at HEIs are crafting learning opportunities that require active student participation, critical thinking, as well as collaboration through the deployment of digital technologies. Technologies such as computer conferencing tools, blogging, simulators, and LMSs, among others, are now very popular and have been used to stimulate students' higher-order thinking skills (Ali, 2012). Terms such as blended learning are now popular because they extend learning opportunities beyond the confines of the classroom walls (Porter, Graham, Spring & Welch, 2014; Taylor & Newton, 2013).

The growth of virtual campuses signals the prevalence of online learning in higher education with many universities around the world cataloguing their services as part of their online degree programmes. Many adults that wish to acquire academic qualifications are finding virtual degrees a flexible alternative offered by the booming educational market (Selwyn, Bulfin & Pangrazio, 2015). Many universities are now inclined to offer modules of existing on-campus programmes in their distance learning programmes with ICT at the forefront (Thoms & Eryilmaz, 2014; Till, 2003). Universities are reviewing their programme delivery approaches and embracing dual teaching approaches that allow for both on-campus and off-campus teaching and learning (Dutton, Cheong & Park, 2004; Shelton, 2013).

ICT in higher education has been mainly used for communicating, searching, the processing of text, information provision, but not necessarily for full online delivery as was envisaged at the launch of online degree courses (Brennan & Naidoo, 2008). Many of the online degree programmes have been found to be wanting because of a lack of proper accreditation and, as

a result, this has raised a lot of scepticism regarding the virtual campuses that have been marketed as “anytime anywhere” learning opportunities (Green, 2001).

Internet-based technologies are altering the higher education landscape world over, and this has translated into lower education costs, increased access to education and training, a better and more cost effective approach to the quality of education (Brown 2002; Jenkins, Browne, Walker & Hewitt, 2011). HEIs have been able to expand their reach as a result of investment in ICT and many have started offering online-based degree programmes that have raked in more revenue, which was not plausible previously. Universities believe that ICT is a vehicle for the renaissance of other aspects of higher education operations (Ahmadi, Keshavarzi & Foroutan, 2011; Dawson et al., 2008). These observations show the extent to which ICT is involved in the management and governance of higher education in the pursuit of meeting the changing demands of the 21st century learner (Ali, 2012).

2.4.2 Developing countries context

Over the past decade or so, higher education has transformed from being a realm of elites that is accessible largely to the wealthiest and most advantaged groups, to a global industry with tens of millions of students enrolling annually. This growth, especially in developing nations, has been particularly rapid in the last ten years. Africa and other regions such as Latin America, Asia and the Caribbean have witnessed a steady rise in enrolment numbers in higher education in the last decade. This demand has been hastened by numerous factors such as the growth in the number of primary and secondary students, creating a large pool of prospective students in the higher education system. Secondly, the opportunities and demands of the global economy are such that lifelong learning has become much more necessary and common in many parts of the world. Moreover, the requirements of the global job market have spurred the growth in numbers of students who need access to higher education (Altbach et al., 2009).

The student population in higher education institutions has been steadily growing (UNESCO, 2006). The fast growth in higher education enrolments echoes the changing demographics, shifting economic structures, and substantial progress in primary and secondary education access (Moe, Blodget, Lynch & Lynch, 2000). Towards the late 1990s, the primary enrolment rates for 75 developing nations had grown to over 90%. This was true for countries like Brazil, Nigeria and Pakistan (World Bank, 2000). Secondary school enrolment also rose by 39% in participating countries (UNESCO, 2006). The increase in enrolment for both primary and

secondary education has created corresponding pressure in the demand for higher education (UNESCO, 2006).

Internationally, there has been a percentage increase of seven percent between the year 2000 and 2007 in the age cohort of students enrolled for higher education affecting both developing and developed countries. In developing countries, a marginal improvement of five percent between 2000 and 2007 in higher education participation was registered. Sub-Saharan Africa recorded the lowest rate of participation in the world at five percent, while Latin America's enrolment rate is still below that of developed countries. Student enrolment involves substantial private costs that average 60% of the GDP per capita (Rena, 2010).

Even though gross enrolment ratios in developing economies still lag far behind those in developed economies, there is a more significant gap in the quality of higher education between developed and developing economies. The appalling state of higher education in developing economies is somewhat attributed to limited resources. Higher education in developing economies such as Brazil, Chile and India has long been poorly financed (Altbach et al., 2009; Rena, 2010). It may be plausible that expenditures per student are far below those in developed economies, and their share in the GDP is also far less.

As a result of these significant and converging developments worldwide, numerous countries have embarked on major transformations of their higher education sectors, including improvements in patterns of governance, funding and the design of evaluation and accreditation mechanisms. This would increase institutional differentiation, curriculum reviews, and ICT innovations. However, growth has been rutted and sharp disparities are still evident across and within higher education systems. For developing nations to be able to compete, it is implied that they have to provide higher education to all sectors of a nation's population (Rena, 2010). Tiene (2004) avers that the various initiatives undertaken by developing nations to increase ICT adoption have often not succeeded in improving education struggles mainly because the efforts are "overly ambitious and overly optimistic about what technology can accomplish" (p. 90).

Institutions in many developing countries fail to appreciate that ICT is more than having the right hardware tools. There are numerous inhibitors and challenges, which may include inadequate ongoing support and the failure to involve academics in the planning process (Tiene, 2004). It has been noted by both Tiene (2004) and Hawkins (2002) that there is a need

to address the needs and limitations of the end users if we are to increase ICT innovation adoptions in developing countries. This can also be done by demonstrating the advantages of ICT innovation adoption.

Most developing nations continue to contend with glitches shaped by inadequate responses to pre-existing challenges. Even though higher education enrolments have improved considerably in many developing countries (Altbach et al., 2009), there is still a wide gap between countries with developing economies and those with advanced economies. Additionally, higher education arrangements continue to be discriminatory. The sustainability of growth in enrolment has been inhibited by inadequate financial resources (Adam, 2003). Rigid governance models are still prevalent in many countries and management practices have not helped HEIs to embrace change and launch ICT-based reforms and innovations (Holm-Nielsen, 2001).

Higher education is experiencing a paradigm shift from being state controlled towards open market economies, from national to global education, from teacher-centred approaches to learner-centred approaches, from one-time education for a few years to lifelong learning for all (Ali, 2012; Venkatesh et al., 2003). These changes pose new challenges and place demands on the traditional education systems and pedagogical practices. In the last decade, higher education has significantly been impacted mainly because of the advances in ICT that have impacted both national and global contexts. The challenges experienced by HEIs demand a rethinking of the management and operational systems, conventional governance models, as well as academic life. Higher education should be more flexible so as to respond to the impact of globalisation (Rena, 2010).

Developing countries are thus challenged with a twofold task. Firstly, they need to overcome the impartiality, quality, coverage gaps and governance-related issues that have traditionally tormented the higher education sector. Alternatively, all countries have to deal with the new challenges emanating from the creation of knowledge economies and democratic societies. The key question here would be whether developing countries can adapt and shape their higher education systems to successfully confront this blend of old and new challenges (Holm-Nielsen, 2001).



2.4.2.1 *ICT in higher education*

Digital technologies are transforming the way in which information is created and shared in many world economies. Technology has permeated virtually all areas of higher education and impacts the teaching and learning practices of educators. Social networking tools offer new approaches to communication and collaboration, as well as joint research (Shelton, 2013). For both developing and developed economies, innovative technologies are now considered crucial in increasing access to higher education. Developing countries still deal with enormous hardware and software costs, training and technical support. This means that the majority of the world's poorest countries have not been catered to in terms of information creation and distribution (Altbach et al., 2009).

The integration of ICT in education presents an opportunity for higher education systems that struggle to meet the challenges of massification around the world. ICT has altered off-campus learning, allowing for growth in the numbers and types of education providers, as well as growth in student numbers, pedagogical innovations and delivery approaches (Porter, Graham, Spring & Welch, 2014). The number of students enrolled in higher education has grown tremendously as a result of adopting ICT, which has given rise to mega universities that boast of over one million students (Altbach et al., 2009).

The last decade has seen large scale 'open universities' dominate higher education with examples such as the University of South Africa (UNISA) which is said to be Africa's leading distance learning university with over 250,000 students. There is also Indira Ghandi National Open University in India with over 1.8 million learners. The African Virtual University with a presence in over 27 countries allows for their programmes to be taught in a number of languages, which makes distance education suitable for students with differing backgrounds (Altbach et al., 2009).

Considering that Africa is the poorest continent, it is swamped by a multitude of challenges ranging from social unrest and political instability to poverty and disease. This makes it difficult to gauge the technological and digital divide between Africa and the rest of the world because of the lack of statistics. Access to ICT correlates with the economic status of a nation (Haddad, 2003). Many developing nations lack the resources that other countries have and therefore find it hard to support ICT integration efforts in higher education. Many countries prefer to spend funds on their military, neglecting education reforms. There is little

commitment to efforts that are geared towards meeting the challenges of the 21st century (Allen & Velden, 2012). The lack of proper infrastructure such as electricity, libraries, and telephone lines has exacerbated the situation.

According to Till (2003), there is an urgent need for a change in the mode of teaching and research in academic institutions given the competing interests exhibited in the world today. He further asserts that this change can give academicians in African universities the confidence to execute their practice and, as such, this could contribute to narrowing the gaping gulf in HEIs in the different regions in Africa. Additionally, Till (2003) avers that universities in Africa still have a long way to go if they are to cope with new modes of teaching, learning, research and dissemination of knowledge through ICT. The older cohort of lecturers who were hired before the ICT revolution are reluctant to make use of ICT and thus do not benefit from the basics of using ICT in teaching and learning, a view that is also shared by Adam (2003).

Kirkwood and Price (2006) assert that the increase in public demand and the growing importance of knowledge as a major driver of development and growth, together with the decline in employment opportunities and with the rapid growth of ICT creates unprecedented challenges for higher education in sub-Saharan countries. Higher education is viewed as a means of crafting better opportunities for individual selection and placement in a competitive labour market. Higher education is viewed as a vessel that can accelerate economic growth and development in general. ICT will still play a crucial role in preparing students to acquire skills and competencies that are essential for competing in the emerging global knowledge economy (Junco & Cotten, 2011).

The increase in ICT usage in higher education on the world stage is changing the paradigm in HEIs from the inside while posing new questions about the role of ICT in higher education itself (MacKeogh & Fox, 2008). For example, many institutions in South Africa have embraced ICT and integrated it into their core processes. However, HEIs in South Africa are challenged by global pressures as well as insistent local social-economic imperatives (MacKeogh & Fox, 2008). These pressures emanate from the need to participate in the new world order that has now been branded as the information society. The higher education sector in South Africa has gone through a process of repositioning and reorientation since the early 1980s, and the transition period has ensured that the sector becomes more responsible towards its many stakeholders while moving away from the state authority that was previously very dominant. Higher education has had to respond to more social interests than before. Different groups such

as trade unions, businesses, associations, industries and regional authorities have, to a large extent, been taken care of (Larsen & Vincent-Lancrin, 2005).

MacKeogh and Fox (2008) assert that ICT is overwhelmingly key in pushing higher education in South Africa to a new world order, “the information society” that is desirable and necessary. However, this may not be easy, especially for those academics who had expected ICT to bring a new lease of life in terms of flexibility and access. Moreover, the lack of technological integration between work and home has only resulted in frustration. The educational development programmes in South Africa need to incorporate ICT-related components if they are to close the digital divide in a society that is divided by class and educational opportunity, and where it is clear that ongoing institutional commitments to equal access to the full range of technological resources remains imperative. Developing countries usually tend to be at the unappealing end of the digital divide spectrum. Nonetheless, they cannot afford to stay passive and be left behind in the race for better education, social, and economic prospects. These countries face challenges, both nationally and internationally similar the situation described by Howie (2010) relating to South Africa.

2.4.3 Challenges to ICT integration in teaching and learning at HEIs

Many researchers have found that ICT has been underutilised in the education sector and many times academics miss out on ICT’s potential to improve pedagogy as well as enhance the quality of teaching and learning (Backhouse, 2013; Fernando, 2012; Sife, Lwoga & Sanga, 2007). Fong et al. (2014) argue that poor implementation and basing ICT adoption on unfounded optimism has been a bottleneck for ICT adoption at HEIs. Many academics are still unconvinced of technology’s potential to enhance the teaching and learning process. Research has identified a number of hurdles to fully integrating technology into teaching and learning processes in higher education (Becta, 2004). Additionally, no universal solutions to problems have been advanced as the integration of ICT is not merely a technical issue.

Richards (2010) argues that sociological, economic, psychological and organisational factors, as well as the characteristics of an innovation could help scholars demystify ICT integration in education. Similarly, research conducted by Sadykova and Dautermann (2009) indicates that ICT adoption barriers vary substantially from one country to another. Studies carried out in numerous parts of the world lend credence to the fact that many challenges lie in the path of successful ICT integration in teaching and learning. The impediments are related to individual,

institutional, national, as well as technology challenges (Ayeh, 2008; Larsen & Vincent-Lancrin, 2005; Letseka & Pitsoe, 2013; Reffell & Whitworth, 2002; Salehi, 2012).

Some researchers have identified the barriers into the two categories of institutional-level barriers and academic-level barriers. Academic (individual)-level barriers were given as resistance to change, inadequate time, and a lack of confidence, whereas institution (school)-level barriers included a lack of effective training in solving problems of a technical nature and inadequate resources (Ingutia-Oyieke & Dick, 2010; Ruthven, Hennessey & Deaney, 2006). Other researchers like Balanskat et al. (2006) have classified these barriers into micro level barriers, for example, those associated with academics' attitudes and approaches to ICT, as well as meso level barriers, such as those associated with the institutional setting. A third group called macro level barriers was also added, with barriers such as those related to the wider educational framework.

Pelgrum (2001) opines that the barriers can be categorised into two kinds of conditions: material and non-material. The material conditions may be manifested as fewer computers or software copies, whereas the non-material conditions include instructors' inadequate knowledge of ICT and skills, ICT integration challenges, and academics not having enough time. However, since this study sought to examine how academics integrate ICT into their practice, the study focused on faculty-level and institutional level barriers, as discussed in the following sections.

2.4.3.1 Academics beliefs, perceptions and attitudes associated with use of ICT

Academics in different institutions and societies embrace ICT in their practice differently; their views on the nature of ICT in terms of characteristics or ICT functionality are mixed, with some faculties encouraging the usage of ICT and others discouraging it (Ottenbreit-Leftwich, Glazewski, Newby & Ertmer, 2010). While others believe that blending ICT with traditional teaching and learning practices will afford academicians and practitioners the most user acceptance and performance (Blin & Munro, 2008).

In their study about “the perception and use of ICT in two Italian universities” Faggiano (2004) revealed that in-service and pre-service mathematics teachers had differing views on the use of ICT in teaching and learning. Whereas in-service teachers were in agreement that ICT enabled better student understanding, their counterparts in pre-service did not think there was a need for ICT in teaching and as a result, were not in a position to deploy these devices in

their practice. They however did agree that ICT was helpful when solving problems jointly and that their perceptions were influenced by the beliefs in their discipline.

In their study, Chan (2002) identified academics' perceptions, use and attitudes towards technology, a lack of academic leadership and a clear vision, as well as the absence of institutional policies as part of the barriers to the successfully integration of ICT. This view is supported Chong's (2006) findings in which it was noted that the respondents complained of a lack of procedures, policies, processes, clearly designed e-learning courses, and a lack of strategic plans. They further maintained that all these issues contributed to poor ICT usage in teaching and learning.

ICT is perceived to enhance capacity and capability in the face of changes in pedagogic needs. Numerous scholars thus maintain that integrating technology into academic practice enhances student-centred learning, promotes improvement in teaching focus and capability, cost reduction, and handling large student numbers (Georgina & Oslon, 2008). However, James (2008 as cited by Blin and Munro, 2008) note that the majority of lecturers in a Bangkok university perceived ICT as complicated when used for e-learning and teaching. This was as a result of a lack of skills and their fear of students' inability to deal with e-learning requirements due to a lack of skills.

According to Guri-Rosenblit (2005), teachers have always been central to the utilisation of any reform that is based on innovation. This view is also supported by Bingimlas (2009a), who notes that having an adequate technological base in a particular school does not guarantee the success of technology-supported education, especially if the teachers are not willing to do so, and more so if they do not have a positive attitude towards the use of technology in their practice.

When the goal of institutions is to promote the use of ICT in education, it becomes essential that teacher's perceptions' in relation to ICT and their use in education be investigated (Rogers, 2004). Similarly, institutional culture has to be evaluated in as far as providing a conducive environment for the integration of ICT in higher education (Sahl, 2002). It was found in studies carried out in turkey and Egypt that the positive attitude of the participating education practitioners strongly influenced the usage of ICT in the classroom, and that prior computer experience played a major role in ICT adoption (Sahin, 2006b).

In expressing the variations in beliefs of academics and ICT implications, it is important that

the social and cultural contexts of institutions where these academics work be taken into account. Teaching and learning at universities is understood to take place within varied cultures that interact in different possible ways. One case is where academics work in different departments and/or institutions and facilitate different subject disciplines where each has the ability to influence their practice with technology (Georgina & Hosford, 2009).

2.4.3.2 Faculties' and students' access to ICT resources

Van Dusen (2014) avers that faculties' and students' access to ICT is dependent on their use of ICT and the cost of network connectivity and computer ownership. The majority of the faculty members and students in developing countries, and more so in Uganda, have limited access to internet owing to factors such as low bandwidth, illiteracy and inadequate ICT infrastructure (Tusubira et al., 2007). Additionally, developing countries, and particularly rural areas, are plagued with unreliable power supply and no internet connectivity. Students in remote areas have to travel long distances to access the limited ICT equipment and services available (Farrell, 2007).

Plomp, Anderson, Law and Quale (2009) posit that for institutions to successfully integrate ICT into education, emphasis must be placed on having access to ICT infrastructure and resources. The effective adoption and integration of ICT into the pedagogical practices of academics in HEIs is heavily reliant on the availability and accessibility of technological resources such as computer software, hardware and networks. As such, if academics do not have access to these ICT resources, then it will be quite to implement these in HEIs. Access to current software and hardware is crucial in the successful adoption and integration of ICT in teaching. Yildirim (2007) avers that access to ICT resources is one of the most effective approaches to educators' integration of ICT in their teaching practice.

2.4.3.3 High costs associated with ICT

The high costs associated with ICT-related programmes are also cited as a bottleneck in as far as the usage of ICT in academic practice is concerned. Stahl (2008) posits that high costs have created a reluctance among faculty members, especially when it comes to using ICT to deliver their content matter to students and this had been worsened by a lack of knowledge and skills. He further notes that academics in third-world universities wishing to use such technologies face exceptionally high costs, more so than their counter parts in the developed world. The importance of these technologies in education and society today is underscored by their

flexibility in delivering content for teaching and learning. It is thus essential that universities procure and use them (Bingimlas, 2009a; Kopcha, 2012).

2.4.3.4 Failure to integrate ICT into educational curricula

Integrating ICT into educational curricula is a complex process of educational change as ICT brings sweeping changes in as far as creation, collection, storage and usage of information and knowledge are concerned (Lai, 2011; Loveless, 2007). The adoptions of these ICTs are varied and in many instances are limited. While many academics are motivated to use ICT in their practice, several studies have revealed that ICT integration may work in some institutions and not in others because of structural institutional characteristics (Lai, 2011). Chan (2002) conducted a qualitative study about individual, institutional, as well as pedagogical impediments to ICT integration for e-learning in the university of Southern Queensland in Australia. In Chan's study, it was noted that institutions and lecturers had established an international reputation because of their usage of technology, and that about 20% of the students at the university in that year were non-Australian residents. As a result, the costs in terms of printing and distribution had reduced sharply. It was further noted that institutional, individual and pedagogical factors still impeded their success despite the fact that ICT provided encouragement and motivation for many educators to look beyond the traditional teaching and learning practice of face-to-face delivery.

Agostinho, Oliver, Harper, Hedberg and Wills (2002) note that African universities are confined to national or regional frames, but because of the continued impact of ICT on contemporary education, universities are becoming international in nature. This requires them to link with each other through advanced networks that connect them to the rest of the world, making them international in nature. Additionally, it was noted that for universities to integrate ICT successfully, the difficulties faced by lecturers should be diagnosed in order to effectively use these tools, especially where many universities are constrained by meagre and tight budgets against other competing requirements. These findings are supported by Kramer, Walker and Brill's (2007) study on the underutilisation of ICT-assisted collaborative project-based learning among educators in Eastern Europe, Africa and north America. In their study, it was noted that a lack of training, IT-related projects, and ICT support, among others, were the main obstacles in Africa, while the other factors were slightly significant in all these cases (Ertmer et al., 2012; Kramer et al., 2007; Pelgrum, 2001).

Agostinho et al. (2002) also posit that ICT users tend to perceive the use of ICT positively when they are physically accessible as access is the biggest outstanding impediment to ICT usage in higher education institutions, especially in developing nations. These views are also shared by Agbonlahor (2006), whose findings point to the lack of training as having an influence on the attitudes, desires and ability to integrate ICT into the university classroom. It is also asserted that lecturers with ICT training have a higher desire to use technologies in their practice.

2.4.3.5 Lack of institutional support

According to Bhasin (2012), the successful integration of ICT is related to structural actions taken at institutional level, this could be attributed partly to solidity of cultural institutional characteristics. This view is also shared by Tearle (2003), who avers that institutions develop unique cultures, which could be loosely defined as ‘the way we do things here’.

Cultural characteristics such as supportive leadership and innovativeness usually reflect a higher level of ICT integration (Fullan, 2002; Haddad, 2003; Mueller, Wood, Willoughby, Ross & Specht, 2008). It is clear that ICT plans that set clear goals and strategies to achieve these goals are fundamental steps towards technology integration. Failures in educational change usually go beyond structural problems such as minimal support, inadequate planning, as well as a lack of materials to include the cultural dimension (Fullan, 2002). Culture is not easy to define given that it is an elusive concept, which makes it implicit that since we only see surface aspects, institutional cultural characteristics relate more to what people perceive, think and feel in regard to the institution.

Nnazor (2009) defines institutional cultural characteristics as the basic assumptions, values and norms together with cultural artefacts that are shared by institutional members, which influence their work at the institution. Burbules and Callister (2000) posit that institutional culture can be a learning assumption shared by a group of members; a presumed way of doing things within a community of academics who deal with similar demands and constraints over time. The identification of cultural characteristics in particular can be grounded in a large body of innovation and change literature that is easily linked to transformations brought about by ICT integration (Tearle, 2003). Similarly, studies by Haddad (2003) and Jankowska (2004) urge that leadership that supports change is important to the successful integration of ICT in pedagogy. The leadership aspect is bound to have specific impact on academics’

implementation of innovations through the influence of participation in decision making, feelings of uncertainty and professional development. This is largely because academics feel that they have the support of their leaders and when problems arise, they will have support, which encourages innovation on their part (Mariya, 2014).

2.4.3.6 Professional development

The professional development of faculty members contributes greatly to the successful ICT and education initiative. Hawkins (2002) avers that other than ongoing technical support, continuous financial support, and an understanding of the user's needs, the lack of professional development is one of the key causes of the failure of education initiatives at both national and local levels in developing countries. Plomp et al. (2003) posit that "staff development is the key element in the implementation plan for any education change" (p. 23). In their study, which examined issues affecting teacher skill, teacher morale, and perceived student learning in ICT-using classrooms, Baylor and Ritchie (2002) argued that professional development significantly influenced how well ICT was embraced in the classroom.

Additionally, Baylor and Ritchie (2002) noted that most training programmes focused more on basic literacy skills and less on integrating ICT into teaching. While technical competence is essential, it is imperative for educators to be knowledgeable in other areas such as ICT, pedagogy, and content (Koehler & Mishra, 2009). This argument is supported by Bingimlas (2009b), who posits that other than simply conducting ICT training, pedagogical training should also be provided to teachers. Professional development is essential for enabling faculty members to effectively use technology to enhance student learning. Koehler and Mishra (2009) find that teachers should have comprehensive knowledge of technology, pedagogy, and content if they are to effectively integrate ICT into the teaching and learning process. The implication is that teachers should receive not only ICT training, but also pedagogical training. Faculties should play an important role in the teaching/learning paradigm shift by employing ICT to facilitate the development of higher-level cognitive skills, problem analysis and the application of what is learnt (Renata Phelps 2008).

Academic development programmes should be created collaboratively based on faculty input and institutional needs. These programmes must furthermore prepare academics to use ICT effectively in their teaching. Teachers that have a strong commitment towards their own professional development tend to be more inspired to engage in activities that lead to a better

understanding of innovation goals (Marcelo, 2009). Georgina and Hosford (2009) explain that training efforts should be ongoing experiences and not one-time workshops since learners need to be continuously updated and kept abreast of changing technologies. There is a need for follow-up training programmes for teachers to keep abreast with new technologies, which calls for training programmes that adequately prepare teachers with the prerequisite skills that are needed to effectively integrate ICT into teaching and learning. Johnson et al. (2015) report that while there has been a noticeable growth in the use of digital tools in education, the training available to educators during their teaching preparation has not been adequate. HEIs seem to be trying to balance research and citations by recruiting more adjunct professors.

Hennessy et al. (2005) maintain that learning institutions should provide teachers with more training on instructional technologies. A lack of training has been advanced by numerous authors as the most common inhibitor to the successful integration of ICT in teaching and learning (Balanskat et al., 2006; Bingimlas, 2009b). Training equips teachers with the necessary skills and knowledge that are required to integrate ICT into their practice, and it also gives them the confidence to use instructional technology (Bingimlas, 2009b). Inadequate training programmes warrant the establishment of faculty development programmes to assist faculties in their ICT integration efforts in the classroom context. Adequate ICT training programmes have promising implications for the successful implementation of ICT in classrooms as they are usually geared towards enhancing and increasing awareness of educational technology, technical efficiency, and changing negative attitudes towards educational technology (Kopcha, 2012) .

Pelgrum (2001) claims that the training of teachers is often snubbed by government initiatives, yet for such initiatives to take shape there is a need for teachers to be equipped with the prerequisite knowledge and skills. This view is also supported by Chan (2002) in his study, where it was noted that in Malaysia, the Ministry of Education realised that teacher training for skills and knowledge acquisition was important for ICT to be successfully implemented in schools. Similarly, Law et al. (2010) also underline the need for capacity building and ICT policy establishment as some of the issues that have to be addressed for ICT implementations to succeed in schools. Dale, Robertson and Shortis (2004) opine that teachers' professional control over their teaching methods seem to be threatened by the introduction of ICT and that teachers' failure to embrace ICT and the opportunities it presents could be attributed to their lack of confidence in using the technologies in the classroom situation (Cuban et al., 2001).

In two studies carried out in The United States of America (USA), Brown (2002) compared the findings before and after 2003 on the motivators and challenges of university faculties in distance and e-learning. It was revealed that faculties were essentially motivated to engage in ICT-related teaching and learning in order to help students achieve their education, but more so to meet psychological needs through incentives like salary enhancement, technology support resultant from teaching e-learning, as well as distance education courses. While the study revealed that factors such as heavy workloads, a lack of institutional technical support, training grants, a lack of merit pay and many others were causing faculties to completely fail to engage ICT in education, the study emphasised that faculty is a key component in the success and growth of distance education. These studies were carried out in a developed world context, thus similar studies need to be carried out in other parts of the world for these findings to be generalisable or validated.

2.5 Higher education and educational technology in the Ugandan context

2.5.1 Uganda's education system: *an overview*

Uganda's education system initially covers seven years of basic primary education. On successfully completing primary schooling, students have the option of enrolling for four years of ordinary secondary education or taking a three-year craft course in a technical school. After the successful completion of ordinary secondary education, they may then choose to enrol for two years of advanced-level secondary education, and two to five years of tertiary (higher) education. Alternatively, students may choose to branch off from ordinary-level secondary education to specialised training institutions. Uganda's higher education consists of two categories - public and private institutions, with the first category mainly composed of other tertiary institutions such as the colleges of commerce, national teacher colleges, Ugandan technical colleges, forestry colleges, health and medical colleges, vocational institutes, agricultural and fisheries colleges, and hotel and tourism institutes as well as universities (NCHE, 2010).

Uganda's higher education sector continues to grow amidst the demand for quality education (Kasozi, 2008). In 1995, Uganda's gross enrolment ratio at tertiary level was 2%, which is way below the 32% sub-Saharan average, however, enrolment increased by 230% percent between 1995 and 2003 (Ayoo, 2009). The average annual rate of growth in tertiary enrolment has been 46% over the last decade. With improved access to secondary education, the demand for higher education is bound to rise further. Uganda has gone from having only one public university in

1986 with a small student population, to over 28 private and public universities with a student population of 84 000. Currently, a number of other non-university tertiary institutions are in place with a total student enrolment of 45 000 (Kasozi, 2008).

Most of the expansion in higher education over the past decade in Uganda has been in the universities sub-sector, which accounts for 65% of the total tertiary enrolment with the remaining 35% shared by other tertiary institutions such as national colleges of commerce, national teachers' colleges, technical colleges, vocational training institutes and others. While Uganda has made tremendous efforts to expand higher education by increasing the gross higher education enrolment ratio from 2.5% in 1995 to 4% in 2004, it still remains a small sector. The expansion in this sector has, however, gained momentum in the recent past primarily due to the increasing social demand for higher education in the country (Andema, 2009). New development in the higher education sector, along with improvements in technology are challenging higher education to offer improved services at many HEIs (Tusubira et al., 2007). According to the National Council for Higher Education, this growth is neither integrated nor diversified, and it lacks a credit system to ease student mobility among disciplines and institutions. A strategic plan to address most of these issues is in the pipeline (NCHE, 2010).

2.5.2 ICT and HEIs: Including institutional policy and strategy issues

As Uganda adopts ICT in education, it faces challenges similar to those of most developing countries: a largely undeveloped ICT infrastructure, low bandwidth connections, unreliable electricity supply, and inadequate financial resources. However, this is bound to change with the continued investments and improvement in wireless network connectivity capacity and the spread in the networks for mobile phones and internet infrastructure. A national policy on ICT is in place and an education sector ICT policy is in the pipelines. The Ministry of Education and Sports has taken steps to co-ordinate ICT development and has allocated resources to support the implementation of its ICT strategy (Farrell, 2007).

Uganda's national ICT policy was first developed in 2003. In the policy framework document, it was acknowledged that it was necessary for Uganda to embrace the goal of 'lifelong education for all'. The second policy objective addressed literacy improvement and human resource capacity-building with strategies to integrate ICT into mainstream educational curricula as well as other literacy programmes to provide for equitable access for all students, regardless of level. This would allow government to set up mechanisms that promote

collaboration between training institutions and the industry as a way of building appropriate human resources capacity. Policy objectives also included the promotion of partnerships between training institutions in Uganda with those elsewhere to enhance skills transfer, amongst other reasons. While the national policy puts particular emphasis on the development of ICT competency among learners, the education ministry seems to be working towards a more unified vision. The tertiary education sector is not particularly integrated at this point and consequently there are no overarching ICT policies or implementation programmes. Typically, initiatives are taken by institutions on an individual basis with the ministry and/or with other partners (Farrell, 2007).

Most HEIs in Uganda lack comprehensive institutional policies and strategies regarding ICT (save for a few, like Uganda's oldest university, Makerere University). With the development of the relevant national policies and strategies, institutions will soon follow suit in aligning their policies and strategies. Some HEIs like Makerere University have put in place an ICT directorate to deal with ICT-related issues (Tusubira et al., 2007). Centralised computing services are developing in most HEIs, but a major debate has been the cross-cutting nature of ICT, so it is important to recognise and consult with all the people who may be involved, both at the strategic and implementation levels. The majority of the universities in Uganda are still in their infancy and, as such, they are still grappling with ICT expertise, which greatly influences their ICT integration efforts. It is thus important that national guidelines are developed on how to establish and manage ICT, especially for recently created HEIs.

2.5.3 ICT and access in HEIs, including literacy issues

Apparently, many academics at Ugandan universities now concur with the view that ICT literacy is a prerequisite skill for both faculty and students, having changed their views that ICT was a specialist skill for the likes of computer scientists (Farrell, 2007). While many HEIs have made various efforts to introduce computers in their core functions, only a handful of these computers are connected to the internet. Most of those that are connected are used for administrative functions and basic ICT skills training (Tusubira et al., 2007). Academics are increasingly aware of the potential affordances of ICT, and thus the need to have ICT skills and competencies is growing. Institutions, for their part, are now embarking on the crafting of institutional ICT policies to guide technology use (Farrell, 2007).

Uganda is still grappling with a number of challenges in relation to integrating ICT in HEIs,

just like many developing economies (Agbonlahor, 2006). The most serious challenge posed to higher education is the rapid expansion of university enrolment (Kasozi 2002; Muzaki & Mugisa, 2006), yet educational institutions have insufficient funds to acquire the facilities needed to deliver quality education to the increasing numbers of students. The system employed, especially in universities in Uganda and other developing countries, is largely that of face-to-face lectures, resulting from the rapid increase in the student populations. Uganda is increasingly looking to integrate educational technologies through avenues like distance education, which reduces the need for educational buildings, provides flexibility for students, reduces the transportation costs incurred by students, allows students to stay with their families and communities, and enables tuition fees to be lowered in comparison to on-campus tuition fees (Basaza, Milman & Wright, 2010).

Nonetheless, the success of distance education is curtailed by poor infrastructure, an irrelevant curriculum, the relatively high cost of education, poor attitudes towards distance learning and inadequate expertise in distance education. One critical challenge, however, has to do with narrow bandwidth, which affects internet speed. Karanja Gakio (2006) states that internet connectivity in Africa's tertiary institutions is "too little, too expensive and poorly managed; as a result, internet technology becomes even less useful for research and education purposes" (p. 41). Farrell (2007) avers that although HEIs like Makerere University, the Mbarara University of Science and Technology, the Uganda Martyrs University and Kyambogo University have made efforts to integrate ICT into their instruction environments, they are still challenged with the maintenance of infrastructure and high costs of purchasing ICT tools. The use of instructional technologies is increasing worldwide because ICT has been found to bridge the gap between students and their learning environment. The augmented use of ICT in Uganda will only aggravate existing challenges, which must be addressed. For distance learning to succeed, there is a need for collaboration among government departments, the business community and educational institutions (Ayoo, 2009).

According to Andema, Kendrick and Norton (2013), ICT has steadily penetrated the wider Ugandan society. The government of Uganda launched a national ICT policy framework in 2006 that envisioned a nation where development, specifically human resource development, would be achieved through the efficient application of ICT and digital literacies. Since then, a number of initiatives have been started to promote digital literacy and ICT integration in educational institutions country-wide. However, progress has been slow and laboured in terms

of the real extent to which ICT policy in education has promoted digital literacy among academics so as to improve pedagogical practice (Andema, 2009). It can be argued from a policy perspective that Uganda has an elaborate policy and a clear vision for ICT application in higher education, but concern is directed towards the extension of policy into practice (Andema et al., 2013).

2.6 Comparison of the findings between the international and Ugandan contexts

This section will attempt to draw a comparison of the findings from an international perspective and from the Ugandan context in relation to ICT integration in HEIs.

From the available literature, it is evident that ICT integration in Higher Education in Uganda is still in its infancy. Although government and institutions realise the importance of adopting ICT, the effort is marred by challenges such as insufficient funds, inadequate ICT infrastructure, and a lack of clearly defined ICT policies on education, among others (Kasozi, 2008; Mutonyi & Norton, 2007). The situation is not very different from many developing economies, especially in Africa, for example, in Nigeria, Ghana, as well as South Africa (Agbonlahor, 2006; Vandeyar, 2006). Developed economies such as the USA, the UK, the Netherlands and Singapore have made remarkable progress in terms of setting up ICT infrastructure for general and educational use and do not suffer from perennial problems such as low bandwidth connections that are characteristic of developing countries (Allen & Seaman, 2010; Bhasin, 2012; Jenkins et al., 2011; Schneckenberg, 2009).

Although Uganda is mentioned as one of the countries that have taken bold steps towards integrating ICT in education, it is no match to economies like South Africa and Egypt, who have considerable ICT infrastructure in place (Adam, 2003; Farrell, 2007). The literature is silent on the specific ICT policies for the education sector in Uganda, just like in South Africa, existent policies are characterised by simplistic goals and are in no way adequate (Vandeyar, 2006). However, the situation is quite different for countries like the Netherlands, the UK, the USA and Singapore, which have formulated ICT policies with achievable goals and have had their curricula revised to integrate the ICT component (Vandeyar, 2006).

2.7 Theoretical framework

Anfara and Mertz (2014) state that the theoretical framework in any research is a structure that presents the theory that explains why the problem under study exists. Mertens (2014) posits that the "exact nature of the definition of research is influenced by the researcher's theoretical framework" (p. 2). The theoretical framework elucidates the study's problem and provides a guide to understanding how it can be resolved. Polit and Beck (2009) clarify that the theoretical framework informs the organisation of the study and allows for the study's results to be generalised to other groups and settings beyond those of the study.

Rogers (2003) defines diffusion as “the process by which an innovation is communicated through certain channels over time among the members of a social system” (p. 12). In this study, diffusion is defined as the extent to which faculties at a university have adopted instructional technology for teaching. Roger's Diffusion Theory seeks to elucidate the process and features that influence the adoption of new innovations (Rogers 1995, 2003). Four major elements of this theory are innovation, communication channels, time, and the social system.

The Innovation

An innovation is defined by Rogers as “an idea, practice or object that is perceived as new by the individual” (Rogers, 2003 p. 12). Instructional technology is the innovation discussed in this study and will include the computer hardware and software used for teaching and learning, network infrastructure for communication, and other computer-related peripherals. The features of an innovation, as perceived by individuals, have an effect on the rate of adoption of a particular innovation, and are associated with the **persuasion stage** of the innovation decision process.

Rogers (2003) posits that when the innovation is perceived to be compatible with existing beliefs, norms and past experiences; is advantageous; has low levels of complexity; has observable results and can be experimented with, then there will be an increased likelihood for the adoption of this innovation. This study sought to understand how academics at a university in Uganda integrate ICT into their teaching practice. It explored the beliefs, perceptions and attitudes of academics who integrate instructional technology into their teaching practice at the university and those who seemed to be reluctant or hesitant to adopt this technology for teaching. In this study, Roger's adopter categories (Figure 2.2) and the innovation-decision

process (Figure 2.1) were used to explore the differences between early adopters and mainstream academics, as well as examining institutional issues surrounding the integration of instructional technology for teaching in higher education. Additionally, the innovation-decision process was used to examine the influence of instructional technology on the educational purpose of teaching within higher education.

Rogers' (1995) five advanced perceived attributes of an innovation that tend to have a strong influence on individuals in relation to their adoption decision are: trialability (the extent to which potential adopters can experiment with the new behaviour), observability (the extent to which the results of an innovation are visible to others), relative advantage (the extent to which a new system is perceived as being better than the alternative it supersedes), complexity (the extent to which an innovation is perceived as difficult to understand and use), and compatibility (the resemblance to previously adopted innovations). These attributes offer a systematic way through which to analyse and understand the adoption and usage of a specific ICT innovation in a particular national context. The choice of theoretical framework was thus informed by the issues reported in the ICT in education literature.

The innovation-decision process

The individual's decision to adopt a particular innovation occurs over time and is not an instantaneous act. Rather, it consists of a series of actions and decisions (Rogers, 1995). The innovation-decision process is defined by Rogers as "the process through which an individual (or other decision-making unit) passes from first knowledge of an innovation, to **forming an attitude** towards an innovation, to a decision to adopt or reject, to implementation of a new idea, and to confirmation of this decision" (Rogers, 1995, p. 163). This is further represented in Figure 2.1 below.

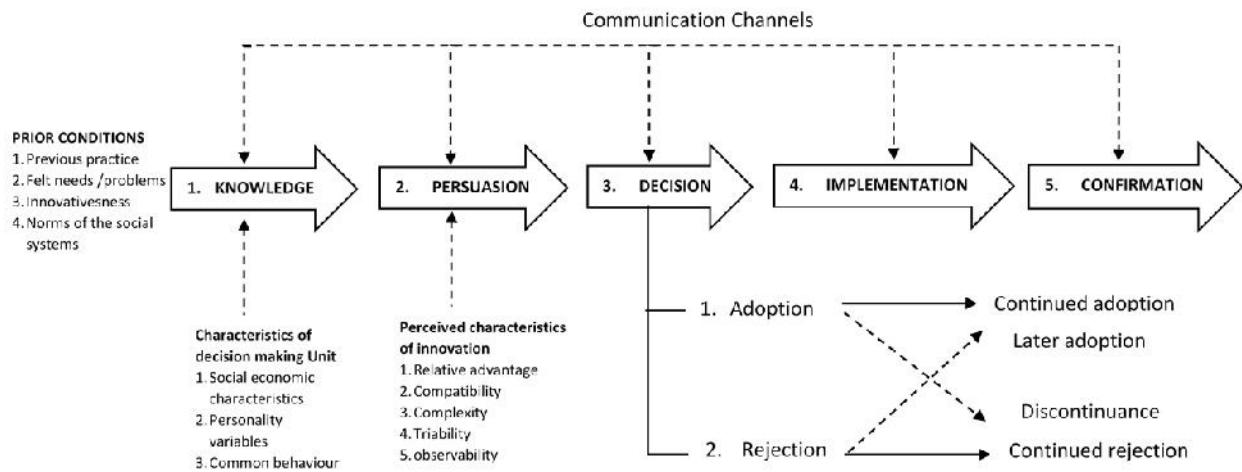


Figure 2.1: A model of the five stages of the innovation-decision process (Source: Rogers, 2003 p.170)

The innovation-decision process largely motivates individuals to reduce uncertainty about the comparative advantages and disadvantages of an innovation through information seeking and information processing activities (Rogers, 1995). Knowledge ensues when potential adopters learn about the innovation's existence and gain some understanding of its functionality. This knowledge may be in terms of awareness of the innovation, how to use an innovation correctly or how the innovation works. Inclinations such as selective exposure and selective perception tend to influence potential adopters' behaviour toward communication messages about an innovation and the effects such messages are likely to have.

Persuasion will occur when an individual forms a favourable or unfavourable attitude towards the innovation based on the characteristics of the innovation such as complexity, compatibility and many others. The subjective opinions of near peers can also influence the adoption decision of individuals positively or negatively (Rogers, 1995). A decision will occur when an individual is involved in activities that lead to a choice to adopt or reject the innovation. When an individual puts the innovation into use, Implementation occurs. Implementation involves a change in behaviour as the innovation is put to use. This phase may continue until the innovation loses its distinctive and noticeable quality as a new idea. Confirmation will occur when an individual seeks reinforcement regarding an innovation decision already made, or falls back to a previous decision to adopt or reject the innovation if exposed to conflicting messages about the innovation.

Adopter categories

The time element of the diffusion process enables us to create diffusion curves and classify adopters into categories. This is largely because individuals in a social system do not adopt an innovation at the same time, innovativeness designates the relative speed with which members of a social system adopt an innovation (Rogers, 1995). The willingness of the members of a population to adopt a particular innovation will vary significantly. Individual attributes can be used to segment the population into five adopter categories, namely: Innovators (INs), Early Adopters (EAs), Early Majority (EM), Late Majority (LM), and Laggards (LGs). Innovators (2.5%) are the risk-takers and pioneers who lead the way. Early adopters (13.5%) get on board the train early and help spread the word about the innovation to others, they have the highest degree of opinion leadership in most systems. Early majority and late majority each constitute 34% of the potential adopting population. They represent the mainstream; their innovation-decision period is considerably longer than that of the innovators and early adopters. The late majority will make the adoption later on when it is in their best interests. Laggards (16%) are the individuals who are extremely sceptical and resist adopting the innovation until it is completely necessary. In some instances, the innovation is never adopted.

Over time, innovations are diffused in a pattern that bears resemblance to a normal bell-shaped curve where time is the X axis and the number of individuals adopting is on the Y axis (Rogers, 1995). The diffusion curve allows for comparison of academics' innovativeness in the university when adopting the innovation in a given time period.

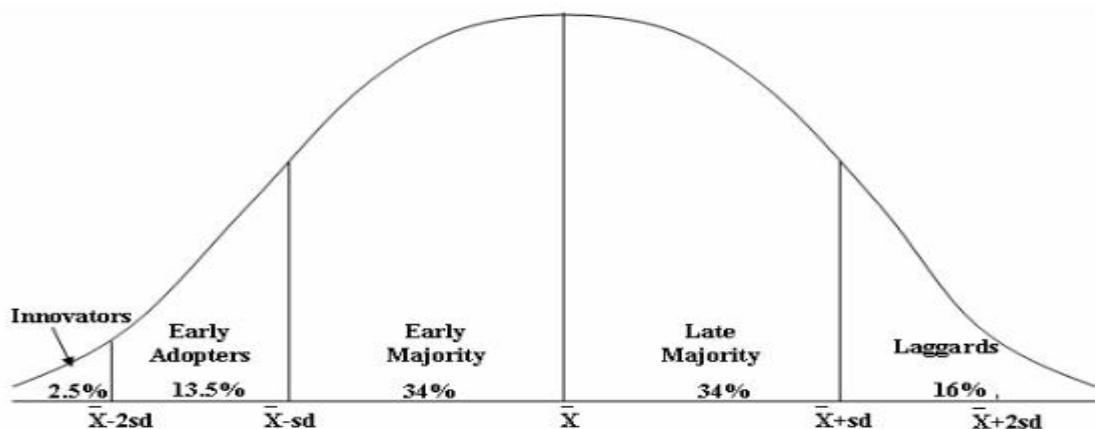


Figure 2.2: Adopter categorisation on the basis of innovativeness (Source: Rogers, 2003 p.281)

2.7.1 Relevance of the DoI to this investigation

A consideration of the objectives of the study suggests a theoretical framework that has components of technological innovation, adoption, diffusion and communication. A number of theories were carefully examined in an attempt to find a theory that encompassed all of these components. The DoI Theory, also commonly referred to as Rogers' Theory, was found to be a suitable framework to guide this study.

Rogers' Theory is considered as seminal in explaining the adoption and spread of an innovation in a society over a long period of time (Agbonlahor, 2006). Rogers' Theory hence offers a powerful paradigm for conceptualising the evolution and acceptance of ICT by individual institutions (Agbonlahor, 2006). It seeks to explain how, why and at what rate new innovations and technology spread through cultures. This study is therefore underpinned by the Diffusion of Innovation Theory developed by Rogers (1995, 2003).

2.7.2 Rogers' Diffusion Theory: Related contexts

The theory can potentially be applied to information technology artefacts, ideas and practices (Sahin, 2006a). The Diffusion Theory has been used as the theoretical basis for numerous information systems projects ranging from agriculture to education (Crowson, 2005; Hariri & Roberts, 2015; Ntemana & Olatokun, 2012; Patzer, 2010; Sahin, 2006a). The Diffusion theories have been widely used to explain the phenomena of technology diffusion in higher education. For instance, Jacobsen (2000) used the five stages of the innovation decision process as a conceptual framework for the consideration of individual experiences in adopting technology for teaching and learning. Vorndam and Ebersole (2002) used Rogers' concepts of adopter categories and rate of adoption to study the differences between early and late adopters, the perceived hurdles and incentives for the adoption of web-based education (WBE) innovations, and the rate at which these innovations are adopted. Samarawickrema and Stacey (2007) used the DoI to examine the adoption of learning management systems in a multi-campus university in Australia.

Similarly, the Theory of Diffusion of innovation has been incorporated into the instructional technology field in an effort to escalate the adoption of instructional technology because of a growing realisation that innovative instructional products and practices have suffered from a lack of utilisation (Law, Yuen & Fox, 2011; Ntemana & Olatokun, 2012). Sahin (2006a) used

the perceived characteristics of innovations to examine why some innovations work and others do not. The findings from Sahin's (2006a) study show that faculty members reported low levels of use and expertise in instructional technologies. Results of the study showed a significant correlation between years of computer experience in general, computer ownership in the office, age, computer access, computer expertise, barriers to computer access, support for computer use, attitude toward computer use, and adopter categories based on innovativeness with the level of computer use by faculty members. Yi, Jackson, Park and Probst (2006) reported comparative advantage, complexity, observability, and image as the most important factors in predicting users' intentions to make use of ICT. Similarly, in a study on the use of the internet as an instructional tool in Brazil, Martins, Steil and Todesco (2004) concluded that the two most significant predictors are triability and observability.

Rogers' (1995) Diffusion of Innovation Theory was used in a quantitative study by Less (2003) to investigate the adoption of computer technology by a faculty in the North Carolina Community College System. Faculty members were classified based on Rogers' five categories of innovation adoption and further classified into users and non-users of computer technology in instruction. Whilst a significant relationship emerged between Rogers' adopter categories and their years of teaching experience and highest degree attained, the results did not show an important difference between faculty adopter categories and age, gender, and race/ethnicity. Also, no significant difference existed between users and non-users in the demographic characteristics of age, gender, race/ethnicity, teaching experience and highest degree attained.

Medun (2001) used Rogers' (1995) Diffusion of Innovations Theory to examine the designated factors that might influence a faculty member's decision and motivation to adopt new digital technologies in classroom instruction. Medun's (2001) findings were organised into three groups, namely: organisational, social, and personal motivational factors. Even though Medun (2001) did not find a significant difference between the self-identified adopter behaviour categories based on Rogers' Theory in terms of social, organisational and personal motivational factors, social factors were found to be the significant predictors that may influence a faculty member's decision to adopt digital technologies in the classroom. The organisational variables were statistically significant in predicting the faculty members' use of digital technologies in the classroom.

Buabeng-Andoh (2012) used Rogers' (1995) Diffusion of Innovations Theory to study the attitudes, skills, and behaviours of the faculty members in relation to their use of ICT in 22

universities in Turkey. Using Rogers' (1995) Diffusion of Innovations Theory, Neyland (2011) employed both qualitative and quantitative research methods in studying the factors that were related to computer use by instructors in teaching and suggested strategies to increase computer use in classroom instruction. Ahmad, Madarsha, Zainuddin, Ismail and Nordin (2010) conducted a computer survey and in-depth interviews using Rogers' (1995) Diffusion of Innovations Theory to determine computer-based technologies that were being used by faculty members and the factors that affected their use of these technologies. Using Rogers' (1995) DoI, Zakaria (2001) conducted a study on the factors related to ICT implementation in the curriculum, where he considered polytechnic faculty members' attitudes toward IT, their IT use in teaching, and the availability of IT.

Burrough (2015) used Roger's (2003) Diffusion of Innovation theory to examine factors that influenced the adoption of Learning Management Systems by medical faculty. The study employed qualitative methods to ascertain factors that late adopters identified as preventing them from integrating technology and to establish measures that would allow faculty increase technology adoption among their peers. Results of the study indicated that late adopters avoided adopting the LMS for various reasons among which were, time, training, system changes, ease of use, lack of technical support, disinterest and the sense that technology did not meet their varied needs. The study recommended that faculty be offered training based on their needs, peer mentoring and modelling of the LMS use among faculty.

Coultman (2015) used Roger's (2003) Diffusion of Innovation theory to investigate the incorporation of professional development activities within the college structure to determine if these mandated requirements resulted in enhanced technology use. Coultman (2015) employed a qualitative case study to identify and describe faculty member's techniques for improving technology adoption with the curriculum at an urban college. The findings of the study revealed that faculty were limited in their use of engaging and infused technology. Faculty were keen on using more technology of various kinds to support more active learning activities for students. They were concerned about their lack of skills and limited time for training. The study also revealed that faculty were appreciative of the professional development offered and learned from the facilitator and their peers.

Soffer, Nachmias and Ram (2010) used Roger's (2003) Diffusion of Innovation theory to study long-term web-supported learning diffusion among lecturers at Tel Aviv University (TAU).

Findings of the study show that the diffusion process among lecturers using web-based instruction was rapid, intense and reached over 77% of the total lecturer population. However, differences in diffusion were found in terms of academic units among lecturers. Soffer et al., (2010) posit that the type of academic unit has a major influence on the success of web-supported learning diffusion. Its influence concerns both the lecturers' initial decision to adopt the new technology tool for instruction and their further wish to continue the usage of web-supported instruction. Furthermore, existence of support policy at the academic unit, as well as campus wide support, is important for a successful diffusion of web-supported instruction among lecturers. The study showed that the process of diffusion of web-supported instruction into academic institutions matches Rogers' Diffusion of Innovation theory.

DoI Theory has been used extensively in ICT adoption studies in developed countries. It is a reflection of the developed countries' context and it is therefore inappropriate to generalise the DoI Theory to suit the global context. This study will examine the applicability of the DOI Theory in integrating ICT into the teaching practice of academics at an HEI with a view to understanding the ICT integration situation in a developing country context.

2.8 Summary

The literature has been reviewed through rigorous analysis from an international, as well as a local context. Various issues have been discussed in relation to ICT integration dimensions, beliefs, perceptions, attitudes, as well as institutional culture issues, trends in ICT integration, and change processes in HEIs towards ICT integration. Further issues such as the role of academics in ICT integration were also discussed. Various issues in terms of the reported successes and benefits of ICT integration in HEIs were highlighted, but there was a notable gap in the literature, which this study has aimed to fill.

It is evident from the literature reviewed that ICT is now a significant element of the education process as both academics and students use ICT resources such as the internet to enhance their social skills and develop their ICT knowledge. ICT savvy students have expectations that learning will involve the use of ICT. Academics must therefore be skilled in ICT so as to meet the changing needs of the 21st century and national goals for ICT skills development. Academics face challenges to effective and meaningful ICT integration in the classroom (Hernes, 2003). To achieve successful ICT adoption and integration, institutions and faculties

are obliged to change their beliefs about and attitudes towards ICT usage (Brown, 2002; Lai, 2011).

The literature reviewed helps to situate Uganda in the debate about ICT integration in HEIs. This literature review indicates that not much is known about the ways in which academics integrate ICT pedagogy into their teaching in HEIs. Given that ICT usage is still in its infancy in HEIs in Uganda, based on the literature reviewed, very few studies have been carried out on this topic. Related to this, the literature reviewed in this section has provided background context for the issues surrounding and related to ICT integration by academics in their practice at HEIs. This chapter touched on elements of belief, perceptions, and institutional culture. However, most of the studies done in this area lend themselves to the developed world, while most of the literature focuses on computer use and the different applications used (Hennessy et al., 2005). Much of the literature is also based on large scale investigations that talk about the scale of computer use and the different applications used. However, these do not tell us about the appropriateness and nature of use (Hennessy et al., 2005). Very few studies were done in Africa, and more so Uganda, and therefore these studies are different in context and not representative of the Ugandan context.

In the next chapter, the research design and methodology applied in this study will be discussed in detail.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

In this chapter, I describe in detail the methodological approach that was employed in this study. A description and justification of the research paradigm employed, followed by the steps involved in conducting this empirical study are sequentially highlighted. The chapter also provides an explanation of methodological matters such as the site and participant selection, data collection instruments, and how the data were collected. I then justify the rationale of the data collection methods as well as the analysis thereof. The section on data analysis explains how the study results were arrived at. At the end of this chapter, I address issues to do with ethics and trustworthiness before I finally inform the reader of my autobiographical role as a researcher, as well as the research limitations of this study. The table below delineates the research strategy employed in this investigation.

Table 3.1: An outline of the research strategy

PARADIGMATIC ASSUMPTIONS	
Meta-theoretical paradigm	<i>Social constructivism.</i>
Methodological paradigm	<i>Qualitative exploratory research design.</i>
Strategy of inquiry	<i>Case study and Narrative Inquiry Approach.</i>
SELECTION OF CASES	
Purposeful sampling	<i>Selection of seven (7) academics comprising five males and two females from Kusoma University (pseudonym) across seven different faculties at a Ugandan university.</i>
DATA COLLECTION	
Data collection methods	<i>Semi-structured interviews, document review observations and a reflective journal.</i>
Data analysis	<i>Content and thematic analysis.</i>
QUALITY MEASURES	
Credibility, Transferability, Dependability and Confirmability.	
ETHICAL CONSIDERATIONS	
<ul style="list-style-type: none"> • <i>Negotiation with gate keepers, which resulted in permission from the concerned authorities (access).</i> • <i>Informed consent obtained from all of the participants.</i> • <i>Attention to issues of the participants' privacy, confidentiality and anonymity.</i> 	

3.2 Paradigmatic approach

Prior to conducting a study, a researcher has some underlying philosophical stance concerning the phenomenon at hand. A philosophy can be construed as a principle, or collection of principles, beliefs, precepts, or aspirations that are fundamental in somebody's conduct or practice within a given context (Creswell, 2003). These act as a fundamental idea that supports a particular discipline of knowledge. It depicts the fundamental beliefs that will provide guidance for action, and is usually mirrored in the strengthening of the researcher's discernment of reality (ontology) and its linkage with knowledge (epistemology) to construct meaning (Audi, 2010). The researcher is thus operating from a particular paradigm. Researchers' paradigmatic approaches will differ because of the different ways in which they view the world, and this will necessitate the selection of an appropriate strategy to observe and measure the phenomenon under study. In the subsections that follow, I discuss in detail my meta-theoretical paradigm (world-view), which influenced my research method (methodological paradigm).

3.2.1 Meta-theoretical paradigm

The social-constructivism paradigm was adopted for this study (Creswell, 2012). Social reality is perceived as an output of its occupants, consequently, the world ought to be unraveled by the revelations that participants construct and reconstruct as an important part of their daily behavior. The significance of culture and perspective in deducing meaning from realities in society, as well as deriving meaning based on this understanding is underpinned by social constructivism. I subscribe to the notion that knowledge is socially constructed as individuals seek to understand the world in which they live and work (Creswell, 2012). This investigation was founded on the epistemological position that there are myriad and multiple meanings that result from individuals' understanding and construction of knowledge, which is often influenced by their experience and their interpretation of those experiences. This enables a researcher to examine the complexity of beliefs other than constricting meaning to restricted ideas. Since the central focus of social constructivism is the constant engagement of individuals in developing the meaning of their ever-dynamic world, I was cognisant of the need to engage the individuals inhabiting the identified social context to gain a better understanding of their experiences as they integrated ICT into their teaching repertoire. In line with keeping the goal of qualitative research, which relies as much as possible on the participants' accounts regarding the study context (Creswell, 2012), I observed the participants' unfolding behaviour as they

interacted with one another in their natural social setting in addition to listening to narratives of their life experiences.

In this study, social constructivism was contextualised to mean that academics are represented in multiple selves due to shifts in social contexts and time. These multiple selves are negotiated and constituted within interpersonal relations and cultural contexts (Raskin, 2002), thus the important need for researchers to interact with the participants in their natural setting to obtain rich data.

3.2.2 Methodological paradigm

“A qualitative research is an umbrella concept covering several forms of inquiry that help us understand and explain the meaning of social phenomenon with as little disruption of the natural setting as possible”
(Merriam, 1998, p. 5).

This study collected data from a natural setting and, as such, my lens identifies me as a qualitative inquirer. The selection of the methodological paradigm was based on the philosophical assumption that the best way to understand a phenomenon is to study it in its natural setting (Krauss, 2005). This approach was appropriate for this study since my interest lay in the lived experiences of people with the aim of understanding how their experiences influenced their context-based practices (Creswell, 2012). Creswell (2012) states that qualitative research is a systematic search for truth carried out in a natural setting and is conceived based on the profound observable facts of an occurrence as it unfolds. This is done with intention of understanding the phenomenon under study. This kind of research is underscored by providing a complete view of the study participants. Qualitative research places emphasis on the understanding and close examination of people's actions, vocabulary and experiences. As Merriam, (1998 p. 11) puts it, research of a qualitative nature “seeks to discover and understand a phenomenon, a process or the perspectives and worldviews of the people involved.” Therefore, research of a qualitative nature employs numerous interconnected techniques with the conviction of understanding the phenomenon at hand better (Denzin & Lincoln, 2011). As a qualitative researcher, my concern was to identify patterns from the unique words and actions of people as they construct and reconstruct meaning within the scaffold of a given experience.

Qualitative research ultimately purposes to discover recurring tendencies (Denzin & Lincoln, 2011), which ideally materialise through systematic observations, corroboration, and the thoughtful examination of a given research problem. Qualitative research often reveals findings that are of a contextual nature and are in no way representative enough to be used for the purpose of generalisation. This approach of searching for first-hand understanding is critical to the philosophical assumptions of qualitative methodology. As a qualitative researcher, I sought to build a rapport with the individuals in the study by involving the participants in data collection (Shenton, 2004). This was supported by the use of a case study approach and other qualitative methods, which involved inquiries into personal experiences, document examination, life story interviews, and observations to found substantial conclusions (Denzin & Lincoln, 2011). Based on my research focus, qualitative approaches were a fitting means to explore the research questions in the quest to comprehend the lived experiences of the participating academics.

3.3 Research purpose

I adopted a qualitative exploratory approach (Yin, 2003) in this investigation so that I would be in a position to understand better how academics create meaning in their lives as they negotiate ICT integration in their teaching practice (Lewis, Thornhill & Saunders, 2007). Grove and Burns (2005) define exploratory research as research directed at discovering new ideas, gaining new insights, and for growing knowledge on the phenomenon. This exploratory study investigated the “little understood” phenomenon (Lewis et al. 2007, p .134) of ICT integration by academics in the sub-Saharan context. This was done in an attempt to augment the existing body of knowledge, academic debates, and make a contribution to better understanding how academics make use of ICT in their teaching practice (Henwood, 2014; Lincoln & Guba, 1985). Consequently, the researcher employed an exploratory case research approach.

3.4 Strategy of inquiry

Maxwell (2012) argues that a research design addresses the planning of scientific inquiry, which implies designing a strategy to find something out. Therefore, the design is what the researcher engages in right from formulating the research problem and questions, the determination of cases, the sampling of participants, as well as data gathering and analysis. Blaikie (2009) posits that choosing an appropriate research strategy is unequivocally founded on acceptable research principles. This research adopted two qualitative traditions as espoused

by Creswell (2012), namely, a case study method, as well as narrative inquiry. The selection of the approaches used in this research are derived from the belief that the naturalistic bearing of qualitative studies has certain benefits for sociology and education studies. This is due to its capacity to reflect the subjective reality of the people that are targeted by policy decisions (Bassey, 1999; Lapan et al., 2011). Being a qualitative study, interviews, observation, field notes and document reviews were employed as data collection methods. In the sections that follow, I define and discuss the two research approaches that were considered and carried out in this study.

3.4.1 Case study

A case study approach is a research strategy that “arises out of the desire to understand complex social phenomena” (Yin, 2003, p. 2). Gerring (2004) has defined case studies as “intensive studies involving a single unit for the purpose of understanding a larger class of similar units” (p. 342). The investigation adopted an **intrinsic** case study approach (Stake, 1995), drawing in particular on the works of Creswell et al. (2007), Yin (2003), Stake (1995), and Denzin and Lincoln (2011). In this study, the case is defined by a university in Uganda with academics integrating ICT into their teaching practice. I elicited the experiences of these academics as actors through an **intrinsic** case study. Yin (2003) clarifies that case studies are a distinct genre of qualitative effort that involve investigating a contextualised, present-day occurrence within a specific boundary. This case was bounded by its particularity to academics and emphasised how academics integrate ICT into their teaching practice (Stake, 1995).

The case study approach is of significance as it has the ability to open the way for discovery by creating an avenue for additional probing that may be pursued in subsequent studies (Silverman, 2013). Yin finds that investigations that seek to answer the ‘how’ and ‘why’ questions should adopt a case study approach, more so when there is limited control by the investigator over events, and especially when the emphasis is on a current phenomenon within a real-life setting (Yin, 2003).

A qualitative exploratory case study was suitable for this investigation since I was concerned with understanding how academics integrate ICT into their teaching practice at a university in Uganda (Stake, 1995). This case study made use of different fact finding techniques such as interviews, observations, as well as document reviews to collect qualitative data (Baker, Edwards & Doidge, 2012; Creswell, 2012; Silverman, 2013). The researcher’s choice of a

qualitative case study offered the most suitable technique to explore how the participating academics integrated ICT into their teaching practice at a university for the following reasons. Firstly, the researcher in a case study serves as a data collection tool in the process of conducting interviews or when carrying out observations. Secondly, the system investigated was a bounded system distinct to this university in particular. Thirdly, the investigator first structured and analysed the facts based on the general themes before he could hone in on the most relevant themes.

Bearing in mind the kind of research questions in this investigation and the interpretive stance adopted by the researcher, the case study approach was deemed as the most suitable research strategy to conduct this investigation. This was the case since it had the advantage of illuminating in detail the distinct beliefs, concerns and perceptions of the different actors in a real-world situation. The case study approach has been found to be appropriate in circumstances where researchers find it difficult to detach a phenomenon's variables from its setting (Yin, 2003).

Critics of the case study approach have argued that the strategy provides little basis for scientific generalisation (Yin, 2003). Furthermore, the richness and intricacy of the collected data implies that one can derive different interpretations and probable 'researcher bias' from the data collected (Smithson & Cornford, 1996). I acknowledge some limitations of the research design in that it was an intrinsic case study which employed subjective measures and thus had limited generalisation (Stake, 1995). The effect of subjectivity was addressed by enhancing the replication of the study through the provision of a detailed description of the research process so that other researchers may repeat the research if they so desire (Berg, 2007). Additionally, even though the research findings may have significant inferences for research, policy and practice, it was never my intention to generalise the results of this investigation. I approached this study with the aim of understanding the single phenomenon of how academics integrated ICT into their teaching practice.

3.4.2 Narrative inquiry

This study utilised narrative enquiry as a method of investigation. Narrative research describes the lives of individuals, collects and tells their life stories, and writes narratives of their experiences (Creswell, 2012). Narrative inquiry has been defined as a multidisciplinary study of the different tasks that are undertaken in the generation and analysis of lived experiences

such as life histories, narrative interviews, journals, dairies, biographies, memoirs, autobiographies and reporting on that kind of research (Clandinin & Rosiek, 2007). The narrative approach was appropriate to uncovering the real world of participants as co-constructed narratives by both the researcher and the participants (Clandinin, Pushor & Orr, 2016). By employing narrative research, I took into consideration that a story can be narrated by different individuals, thus reflecting multiple views of the phenomenon in question. Narrative studies fit well within the boundaries of social constructivism and critical thinking, which places emphasis on the connotations that humans use to make sense of their lives (Neuman & Kreuger, 2003). Moreover, a narrative in this study involved meaning-making of experience through conversations, open dialogue and the on-going lives of the participants (Clandinin et al., 2016).

This study explored the experiences of academics at a university in Uganda, highlighting their practices, beliefs, attitudes and perceptions as they integrated ICT into their pedagogical practices. Connelly and Clandinin (1990) argue that narrative inquiry can be both a phenomenon and a method of study. In this investigation, it was used as a method of study. While narrative inquiry is a research methodology that is growing in both acceptance and practice in fields such as social work, law, organisational studies and teaching. However, it is not without its weakness as critics of the narrative approach argue that, in some cases, participants may try to ‘fake the data’, thereby substituting falsehood for truth (Connelly & Clandinin, 1990). Method triangulation was used in this study to address this weakness. Method triangulation often involves multiple data source usage to address the weakness exhibited by one data collection method (Denzin & Lincoln, 2011). Also, the researcher may intentionally “polish” the participant’s story during reporting, a process referred to as “the Hollywood plot” which has been labelled as a danger in narrative research (Connelly & Clandinin, 1990, p. 10). In this inquiry, care was taken to tell the story of the participants and not my own. I attempted to eliminate “the Hollywood plot” effect by reflecting on the selections made, examining the different stories, and other restrictions perceived from the vantage point of "I the critic." (Connelly & Clandinin, 1990, p. 10). Additionally, care was taken to allow the participants to read through the interview transcripts as a form of member checking (Creswell et al., 2007) to ensure that their views had been correctly captured by the investigator.

3.5 Research methodology

The research methodology is viewed as a means of effectively collecting useful and pertinent information for a specific investigation, which progresses from fundamental assumptions to the design of research and the methods of data collection (Myers, 2013). This study used purposive and convenience sampling (Henning & van Rensburg, 2004; Hoyle et al., 2002). Purposeful sampling involves a researcher selecting a sample that will enable him or her to learn the most (Merriam, 1998; Patton, 2002). According to Patton (2002), purposeful sampling is beneficial in that, “Any common patterns that emerge from great variation are of particular interest and value in capturing the core experience and central, shared dimensions of a setting or phenomenon” (p. 34). In the sections that follow, I explain the numerous techniques that were employed in data collection from the site and participant selection to data analysis. I also provide a schematic representation of the research process that unfolded in this investigation.



3.5.1 The research process

The research process followed in this study is presented in Figure 3.1 below and embellished upon in Section 3.5.2.

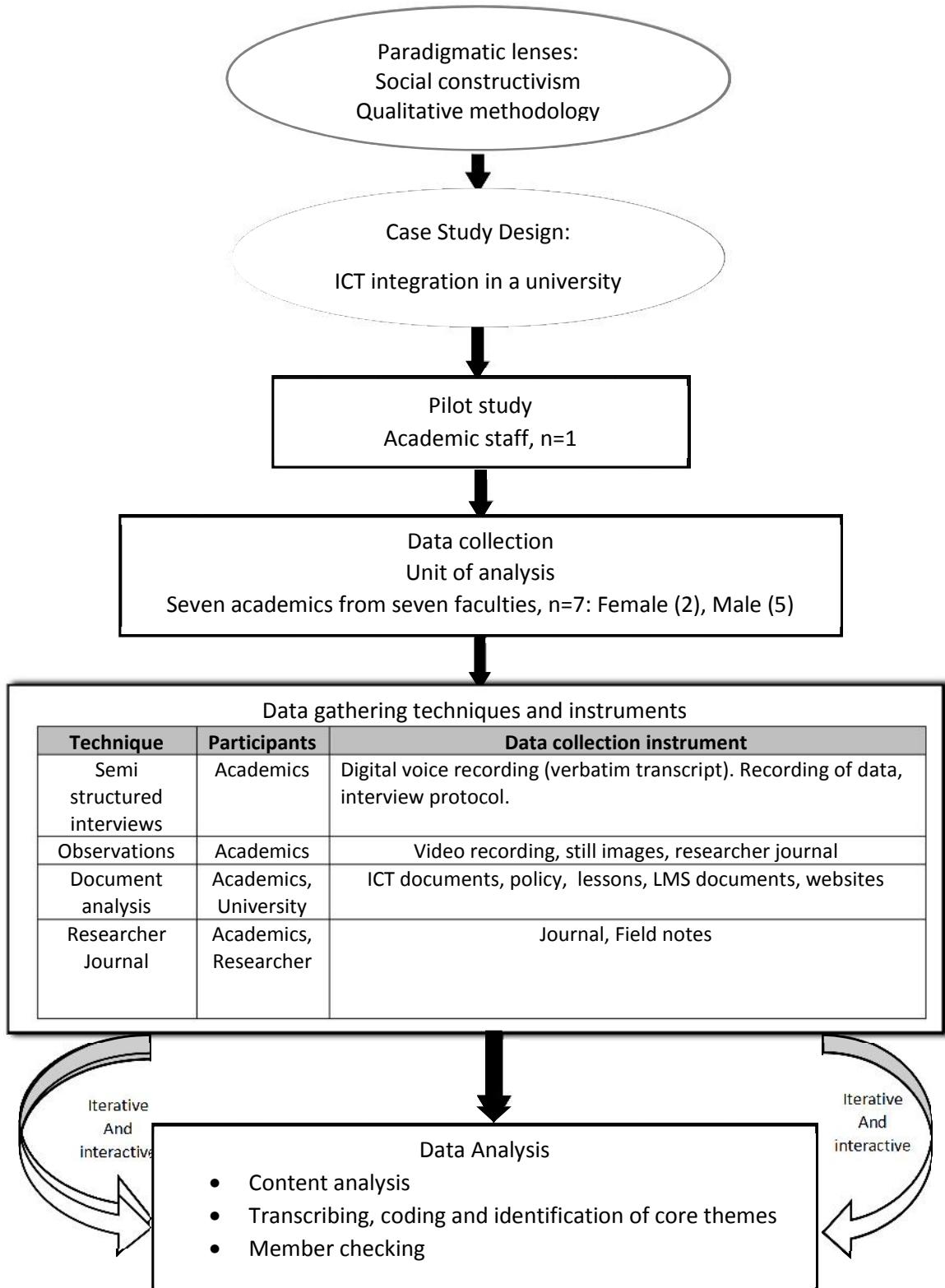


Figure 3.1: Research Process (adapted from Vandeyar, 2006 p.103)

3.5.2 Selection of the research site

The research site was a university in Uganda. The principle criterion in purposively (Hoyle et al., 2002) selecting this university was not about representing the totality of universities in Uganda that have heavily invested in ICT. Rather, the goal was to have a contextual setting within Uganda that would best provide an understanding of how academics integrate ICT into their teaching practice, their perceptions, beliefs and attitudes in light of integrating ICT into their teaching practice, and how ICT may add to the teaching experience of academics at this university. Additionally, the choice of this site was influenced by Stake's (1995) view that the cases selected should offer an opportunity to learn.

3.5.3 Research site description

The study was carried out at a University in Uganda, East Africa, hereafter referred to as Kusoma University. The university is located in a central region with four outreach centres in other parts of the country. At the time of this study, it had a student population of approximately 16,000 students enrolled in its various undergraduate and postgraduate programmes. The Universities and other Tertiary Institutions Act (2001) empowered Kusoma University with a policy-making organisation, namely, the school council, which makes policies that are implemented through committees and an administrative organisation that is also managed through committees (NCHE, 2010)

Kusoma University has a history of novelty in practice and a track record of good performance, and calls for high levels of professionalism from members of staff. The university undertook bold initiatives in the last ten years to put in place an ICT-enabled teaching and learning environment for both faculty and students. This culminated in the launching of a Digital Centre and, more recently, a Learner Management System (LMS) based on the Moodle platform. This was aimed at creating an environment that would promote the incorporation of ICT in the pedagogical practices of academics across the curriculum, bearing in mind that the classroom environment should be designed to meet the learners at their point of need and consequently be able to enrich their learning experiences in the digital age. Academics would then be required to embrace ICT in their pedagogical practice to guarantee that curriculum delivery involves ICT-integrated lessons to enhance learning experiences.

For the purposes of this study, the academic departments were of particular importance. The organisational structure of Kusoma University comprises seven faculties ranging from the faculty of entrepreneurship and business administration to the faculty of computing and management science. Each faculty is made up of two or more departments and maintains links with the professional bodies and associations whose work they uphold. The structure of the university is represented in the organogram below.

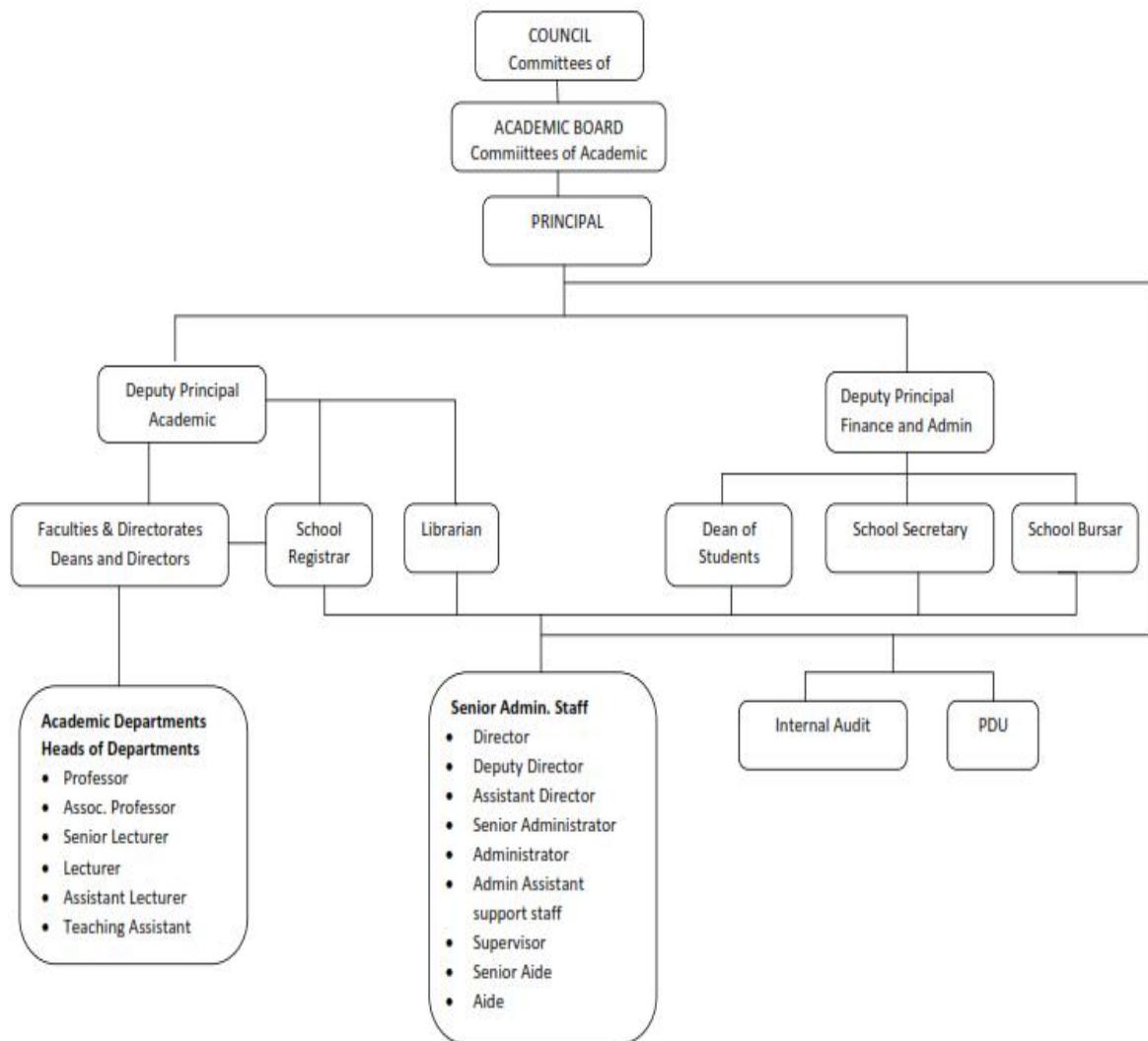


Figure 3.2: Kusoma University organogram

3.5.4 Selection of participants

The participants in this investigation were purposively selected (Hoyle et al., 2002; Stake, 1995). The reason for purposive sampling is justified by Hoyle et al. (2002 p. 187), who posit that “one can handpick the cases to be included and thus develop samples that are satisfactory in relation to our needs.” This argument is also supported by Bless and Higson-Smith (1995,

P. 95) in stating, “Based on the judgment of the researcher regarding the characteristics of a representative sample.” The selection was further influenced by the availability of academics as participants that had integrated ICT into their teaching practice. This is also supported by Bless and Higson-smith’s (1995, p. 94) assertion that, “The interviewer will choose, for instance, a convenient place where he or she is assured of finding many people.” The rationale for the purposive selection of the site and participants was that this study was based on the ultimate goal of qualitative sampling, namely, obtaining rich cases to respond to the purpose and research questions of the study (Denzin & Lincoln, 2008). The sampling technique may have its shortfalls since it is not easy to generalise the study results as this approach depends on the researcher’s idiosyncratic research focus (Bless & Higson-Smith, 1995). However, it is important to note that this investigation’s purpose was to obtain thick and rich data from the participants that would describe the phenomenon, and not for the generalisation of the findings (Yin, 2003). Henning and van Rensburg (2004) posit that research of a qualitative nature enables the investigator to analyse the characteristics, activities and qualities of a phenomenon at length to understand it better.

The principal study participants were academics employed at the university. One academic from each of the seven faculties at the university (the Faculty of Management and Public Policy, the Faculty of Commerce, the Faculty of Entrepreneurship and Business Administration, the Faculty of Marketing and Hospitality Management, the Faculty of Computing and Management Science, the Faculty of Vocational and Distance Education, and the Faculty of Graduate and Research Studies) was purposefully selected to participate in this study (Hoyle et al., 2002; Stake, 1995). The participants that were purposively selected for this study had to have been teaching at this university for not less than three consecutive years. This period allowed the participants to have accrued sufficient teaching experience at a Higher Institution of Education (HEI).

Table 3.2: Background information of the participants

Pseudonym	Academic Rank	Highest Qualification/Degree	Gender	Age	Number of years in HEI (experience)
Magufuli	Senior Lecturer	PhD	Male	35	9
Loketo	Lecturer	MSC	Male	35	9
Wakukyalo	Lecturer	MSC	Female	36	8
Musomesa	Associate Professor	PhD	Male	48	18
Mukyala	Lecturer	MSC	Female	35	10
Twatoba	Senior Lecturer	PhD	Male	40	19
Makyati	Assistant Lecturer	MSC	Male	39	8

In order to obtain the data, an official request was made to have a list of names, contacts and ranks of all the full-time (permanent) academic staff that had been in active service for a period of three or more years. The list was then used as a lead in identifying suitable participants. The research participants were initially contacted via e-mail and later by telephonic means to seek their consent to partake in the study. This was followed by personal contact to request the academics to be participants in this study. One academic staff member was selected from each of the seven faculties, with a total of seven participants in this study. Attempts were made to see to it that the study participants were representative of the staff in these faculties. This was done intentionally as I was aware that even within the same institution, the lived experiences in one faculty or even department may differ from those in another (Knight & Trowler, 2001). This view is also held by Green and Myatt (2011), who posit that different academics will narrate their stories differently given different contexts.

The seven individual cases selected for this study made significant contributions as they allowed a nuanced understanding of both how and why academics integrate ICT into their teaching practice in the ways in which they do (Draper, 2010). This was partially achieved through observing the use of ICT in the real classroom context, which was unique to each individual case. Additionally, it was also achieved by designing this part of the investigation as an intrinsic case study, allowing the researcher to develop conceptual categories inductively to examine the initial assumptions (Merriam, 1998) without evaluating or judging. This was important in answering the ‘how’ questions that arose in this study.

3.5.5 Data collection method

A triangulated methodology was employed in this study (Shenton, 2004), namely, through a pilot study, interviews, document reviews, and observations, which are mainstay techniques for data collection in case study research (Robson, 1993). When several sources of information are used in a case study, then there is a likelihood that the findings of the study are much more convincing and accurate, thus increasing the construct validity (Yin, 2003). Triangulation permitted the findings from one form of data collection to be checked against the findings derived from another other form. This enhanced the validity of the findings (Miles & Huberman, 1994). Bryman (2006) posits that a multi-strategy approach to data collection in a given investigation is likely to provide the researcher with a better understanding of the occurrence under investigation, which would be difficult if only one method was used. This also assures the reliability of the conclusions or findings with the chance to examine the event from different perspectives. In this study, I employed a multiplicity of data collection techniques as discussed in the sections that follow.

3.5.5.1 Pilot study

Pilot studies have been referred to as feasibility studies by some researchers (Van Teijlingen, Rennie, Hundley & Graham, 2001). Studies of this nature are often conducted for numerous reasons. Of significance in this investigation was the desire to assess the research interview protocol as a realistic and workable tool for data collection. The pilot study served to gain initial contextual understanding through the assemblage of vital information for an effective research design. This also allowed the development of better cognisance of the dynamic events, environment and mediators that could positively alter the research progression and affect decision making (Van Teijlingen & Hundley, 2002).

This study made use of a pilot study in developing and testing the research instrument, designing the interview protocol, and assessing the appropriateness of the tool for collecting primary data from the target population (Van Teijlingen & Hundley, 2002). The selection of the pilot study participants was as close as possible to the actual study participant sampling as this was intrinsic in allowing the investigator to identify and correct any anomalies that would otherwise arise in the actual study (Glesne, 2006).

Although a pilot study is not a guarantee for success in the main investigation, it raises the likelihood of success in the main study, and therefore pilot studies are an important aspect of a

good study design. This pilot study was used mainly to pretest the semi-structured interview protocol (Berg & Lune, 2012) and several changes were made that involved the designing and redesigning of the interview protocol (see Appendix A). The protocol was pilot tested with one of the academics at the university who was conveniently selected based on her expertise in integrating ICT into teaching. The pilot study lasted approximately 50 minutes.

Working from the results of the pilot study, I re-evaluated whether the questions in my interview protocol were well-phrased to prompt the appropriate responses, and began to fine tune some of the questions. For example, I minimised questions that called for simple yes or no answers and added prompts to certain questions that required more detailed responses. The data from the pilot study were intentionally set aside as the interview protocol was somewhat modified after the pilot study. Therefore the data collected throughout the pilot study would be incorrectly represented in the core study (Van Teijlingen et al., 2001).

In this case, the pilot study provided a lead in identifying an initial set of informants and the identification of initial categories employed in the design of the interview scripts for the next phase. The pilot study also confirmed that the study was not only feasible but seemed to be interesting and useful. I became aware that my preconceived views on certain issues might have a bearing on the behavior of the participants, and thus the integrity of data through my own body language, intonation and statements. Challenging as it may be, I endeavored to make minimal use of these verbal and non-verbal cues, apart from cases where I had to signal to the participant that what he or she had to say was of importance to me (Vandeyar, 2006).

3.5.5.2 *Interviews*

Donalek (2005) contends that interviews form an important part of the researcher's understanding of the human experience. Furthermore, Pratt (2009) posits that interviews form an important part of the qualitative research process that supports answering the 'how' question. To Pratt (2009), interviews aid the investigator to collect data on matters from the informant's point of view and thus help the investigator to scrutinise and understand the process. In this study, data was collected by engaging participants in face-to-face semi-structured interviews (Denzin & Lincoln, 2008). All seven participants were interviewed as engaging multiple participants' purposes extends the understanding of the investigated experience (Polkinghorne, 2005). Semi-structured interviews were employed in order to provide the interviewees with the scope to fully explain their stance and to raise issues that they

deemed important. The process of personally conducting the face-to-face semi structured interviews was vital as it allowed the investigator to pursue specific issues that were of concern and to probe comments of importance or that lacked clarity that could lead to focused and constructive suggestions (Patton, 2002). Similarly, the interviews gave the investigator the opportunity to phrase and re-phrase the questions, especially when the interviewees were silent after a question was posed so that they were understood by all respondents in the same way.

An interview protocol for the seven candidates was developed with the first section having probing questions on the background contexts (life history) of the participants. The protocol was structured and aimed at building a rapport between the participants and the researcher. Hill, Thompson and Williams (1997) aver that probing questions on their life history can aid the participant to feel comfortable, as well as contribute to collecting essential demographic case study evidence. This made it possible for the investigator to capture rich and thick data relating to the participants' lived experiences as a narrative inquiry. The second segment of the interview protocol design concentrated on the experiences of academics in light of integrating ICT into their academic practice (Leech, 2002). The interview protocol was developed as a set of open-ended questions with the flexibility to alter and change the sequence of the questions based on the manner, suitability and context in which the discussion flowed (Fontana & Frey, 2005). This enabled the investigator to make use of the limited interview time, as well as interview several participants in a similar methodical and comprehensive manner whilst retaining focus (Vandeyar, 2006).

Each of the seven participants was interviewed for a period lasting between 45 minutes and one hour and the interviews were conducted within the institutional premises. Primarily, the interviews were used to delve into the perspectives, experiences and opinions of each faculty member with regard to integrating technology into their teaching practice. In the process of data collection, I attempted to be reflexive by reporting on exactly what had transpired. I thus employed 'bracketing' (Ahern, 1999) in an effort to set aside my researcher assumptions and influence in order to elicit the reflected experiences of the respondents. A total of seven interviews were conducted all together. Pratt (2009) argues that qualitative research lacks an agreed-upon acceptable number of respondents. Pratt (2009) further claims that there are varied responses to what may constitute enough responses, but this largely depends on the nature of the research question that the study sets out to answer. Open-ended interviews were deemed the most suitable because of the exploratory nature of this study (Fontana & Frey, 2005).

The interviews afforded the academic participants a chance to offer a more elaborate narrative of their lived experiences and at the same time allowed the researcher to listen to their life stories. This acted as a social critique and offered insights into each academic's ongoing process of ICT integration in their teaching practice. The data captured from the interviews augmented my understanding and thus was useful in analysing the interviews in their context. The data generated from the interviews was used to compare and obtain the common issues and experiences of the academics, which could lead to codes and themes for data analysis (Merriam, 1998).

I relied on audio-digital recording equipment to preserve the answers of the interviewees for further use (Stuart, McCutcheon, Handfield, McLachlin & Samson, 2002) in the process of data analysis and categorising. Seidman (1998) clarifies that it is important to record an interview because "...if something is not clear in a transcript, the researchers can return to the source and check for accuracy" (p. 97). Patton (1990) contends that a digital tape recorder is an 'indispensable' instrument for capturing data (p. 348). Walsham (2006) asserts that it allows the researcher to concentrate on other equally important issues such as engaging the interviewee. After each interview, I downloaded the audio recording for playback during transcription. Each of the resultant interview transcripts comprised part of the data source for analysis. The act of transcribing audio files requires a lot of time and is a costly procedure (Seidman, 2013). Approximately six hours of transcribing time were spent for each and every hour of the interviews. Semi-structured interviews were used as one of the primary data collection instruments as a means to cross check my observations, journal reflections and field notes.

I acknowledge the possible limitation of the face-to-face interview data collection approach as participants may tend to provide responses that they imagine the investigator wants to hear (Glesne, 2006). I regularly visited the university to mingle with the participants in their natural setting in order to gain their trust and confidence before the formal interviews commenced. This was an attempt to reduce the Hawthorn effect. Additionally, I maintained communication across various mediums such as WhatsApp chats, e-mails, SMS's and telephonic means to promote a bond of trust between myself and the participants before scheduling the interview meetings.

3.5.5.3 *Observation*

Hopkins (2014) distinguishes three types of classroom observations. Firstly, open observation is where the observer simply notes what may seem important to him/her. Secondly, focused observation is where the observer has pre-determined the foci of observation and this is based on pre-existing categories for recording information. Thirdly, organised observation is where the observer has decided the focus of the observation, such as ICT tools in use, pedagogy, classroom layout, and has discussed it with the person observed. The investigator adopted focused observation in this study, focusing on well-defined types of pedagogy, classroom layout, time management, ICT skills, student involvement, as well as the specific use of ICT in the classroom. I was cognisant that despite the well-established benefits of observation, academics would be reluctant to accept an observer in their classroom. I therefore tried to create mutual trust between myself and the academics who integrated ICT in their teaching practice before the interviews were conducted.

In using this approach, I was careful to follow all of the requirements which are deemed essential for an effective observation. Harris (2002) posits that the researcher must (a) Make transparent the aims of the observation process from the outset, (b) Simply note what appeared to him/her as relevant to the purposes that were set, and (c) Decide the exact purpose of the observation and focus on those teaching skills and techniques and models that are central to teaching repertoires with computers.

Emerging from the social constructivist paradigm, I adopted unstructured observations for this study as emphasis was placed on the “context and the co-construction of knowledge between the researcher and the researched” (Mulhall, 2003, p. 306). I embarked on classroom observations after concluding the face-to-face interviews. The data were captured using a digital camera for both video and still images. The observations were guided (see Appendix B) using three procedures inherent in observational research, as espoused by Angrosino (2005, p. 732). In terms of descriptive observation (Angrosino, 2005), care was taken to eliminate any preconceptions as a means of eliminating investigator bias and to “maximise observational efficacy.” Additionally, detailed descriptions were noted for any activity in the observed environment. I then employed focused observation (Angrosino, 2005) in which field notes on observations and resources that were significant to the investigation were documented. Emphasis was placed on well-defined categories of specific ICT tools in use, pedagogy, ICT skills, and time management. Lastly, my observation involved the systematic selection,

viewing and recording of behaviour of the seven participants. Objects such as ICT tools in use, as well as phenomena in regard to how these tools were being used for teaching were analysed (Randolph, 2007).

Unstructured observation (Mulhall, 2003) was instrumental in capturing not only the process of ICT integration but also the circumstances surrounding this phenomenon under study. In employing unstructured observation, my role was that of a reactive observer (Angrosino, 2005). I adopted this approach to gather naturally occurring data about social processes (Silverman, 2013). Observations of lecture presentations formed part of the data collection, and this was crucial in understanding the account of particular events, the description of activities, the participants' behavior, as well as a description of the physical setting (Bogdan & Biklen, 1998). I acknowledge that in my role as a reactive observer, I was not divorced from the social setting under study (Giacomini, Cook & Group, 2000). Reactive observations are controlled settings where it is assumed that participants are mindful of being observed and are "amenable to interacting with the researcher only in response to the elements in the research design" (Angrosino, 2005, p. 732).

The researcher assumed the role of a reactive observer (Angrosino, 2005) premised on the useful source of data that this method yields. I acknowledge that my presence in the research setting may have been a source of bias. While it creates avenues for observation, it also poses challenges as to whether the observed social interactions among other participants are natural. In an attempt to reduce observer bias, I elicited feedback from the participants whose behaviour were being reported. This process brought forth two distinct benefits, firstly, by showing the participants my observation notes, I could establish a "self-correcting investigative process" (Angrosino, 2005, p. 733). Secondly, the disclosure of my observational notes to the participants improved the "rapport" (Glesne, 2006, p. 110) as a "distance-reducing", "anxiety-quieting" and "trust-building" mechanism. This was useful in addressing the issue that people do not necessarily say (in interviews) what they do in practice (Argyris & Schon, 1974; Pope & Mays, 2006). Additionally, observation offers insights that the study participants are unable or unwilling to share with the researcher. This allowed for observation of situations that the study participants had described in interviews, which created awareness of inaccuracies or distortion in the descriptions provided by the participants.

To capture rich and thick data, I employed several approaches of documenting my observations. I used video recording, digital photographs, field notes, and a reflective journal.

Angrosino (2005, p. 74) suggests that “technology makes it possible for the researcher to record and analyse people and events with a degree of particularity that would have been impossible in the past.” At the end of the observation, I made notes of the discussions in the field notes so that I could later reflect on what was said. In total, two observations were made for each of the seven participants. Additionally, I performed a selective observation (Angrosino, 2005), recording the field notes on lecture room management issues, lecture room layout, and discipline.

3.5.5.4 Document reviews

Interviews and observations were complemented with the use of document reviews as another data collection technique in this investigation (Silverman, 2013). A document can be described as any material that offers data pertaining to the investigated phenomenon and occurs autonomously of the researcher’s actions. Corbetta (2003) posits that one of the merits of a documents review is that it is a non-reactive method through which data specified in the document is not subject to a potential misrepresentation as a result of dealings between the researcher and the respondent. However, Patton (2002) opines that documents are sometimes characterised by inaccuracy and the incompleteness of the data, making them unreliable. In order to reduce this effect, the investigator compared documents that contained similar data, checking the documents against other data that had been collected. The researcher further talked to people who were involved in the creation of the documents so as to determine the accuracy of the documents.

Documents are usually created for particular purposes different from those of the researcher, but a researcher can make use of these documents for cognitive purposes. For example, dairies, newspapers, policy documents, websites, and letters (Corbetta, 2003). Yin (2009) opines that for case studies, “The most significant use of documents is to corroborate and supplement evidence from other sources” (p. 103).

This investigation made use of document analysis to systematically review and evaluate documents that were both electronic and in print (Bowen, 2009). A number of documents were critically analysed (see Table 3.3). The data from these documents were scrutinised and interpreted so as to derive meaning, and to gain an understanding as well as to develop empirical knowledge (Corbin & Strauss, 2008). These documents were found to be of great value as far as examining the different perspectives of the study and enriching the investigator’s

knowledge on the subject matter. Document reviews allowed me to take note of and follow up on any inconsistencies in the evidence evolving as a product of the data garnered through the interviews and observations with the participants.

Table 3.3: Documents analysis

No	Item	Description
1	HEI - ICT policy	See Appendix H
2	University artefacts	Newsletters; ICT presentations; photographs; ICT strategic plan; staff development plan; staff ICT resources and evaluation forms.
3	Learning Management System	Module codes; lectures delivered through LMS; subject content; resources; and links (see Appendix D).
4	Teaching plans - preparation	Course outlines, timetables, and study guides.
5	Websites	University Website/academics' resources; faculty web pages, Facebook pages, and weblogs.

3.5.5.5 Researcher Journal

Qualitative investigators are part of, and not removed from the phenomenon being studied, and must unceasingly take their position as the main object of data collection (Holloway & Wheeler, 1996). The researcher retained a research journal during the data collection and analysis process. I employed reflective writing (Thomas, 1995) in the course of this study as this was useful in documenting and reflecting on my own understanding of the research process (Janesick, 1999). I embarked on making a journal entry immediately after every interview. The numerous journal entries encompassed notes on my discernments of the participants and memoirs of how the participants conducted themselves and spoke during the interviews. These entries were useful in letting the investigator induce the meanings of narratives that the participants gave in the interview in the course of analysing the data, as well as identifying any ambiguities or comments that the researcher deemed important in the findings.

Because researchers are the main instrument who see, hear, feel and interpret the responses of informants, they may only report on information in which they have an interest. This may create bias and subjectivity. The researcher therefore ought to be reflective and aware of personal

assumptions to increase objectivity. By recording subjective information in the researcher's journal, such as individual impressions that could have an impact on the data analysis procedures, it was possible for the investigator to make notes on what would be guarded against regarding subjectivity throughout the data analysis process. Bracketing (Fischer, 2009) was thus used as a reflective technique throughout the study and each phase of the investigation was approached cautiously in order to avoid prejudice, set aside bias, and approach the phenomenon with an open mind.

This created a sense of heightened professional awareness that was instrumental in arriving at informed decisions during the research process (Holly, 1989). To the reader, the journal provides insight into the opinions and perspectives (Halbach, 1999) of the investigator regarding the research process and the integration of ICT into academic practice at HEIs.

3.6 Data Analysis

Bernard (2006) posits that data analysis "is the search for patterns in data and for ideas that help explain why those patterns are there in the first place" (p. 452). This qualitative study captured raw data in the various forms of audio, video, documents, still images, as well as field notes. Data emanating from the collection of data was converted into text as text was the primary source and object of interpretation (Schwandt, 1999; Vandeyar, 2006). Content and thematic analyses were used to analyse the written, verbal and visual communication messages (Silverman, 2013).

3.6.1 Content analysis

Content analysis was used to make inferences by systematically and objectively identifying the features of the messages (Silverman, 2013; Stemler, 2001). In this study, content analysis allowed me to work through the voluminous data collected from the participants in a systematic way. In this section, I attempt to provide an elaborate explanation of the analysis process.

The techniques of content analysis as proposed by Silverman (2013) and Stemler (2001) were used to examine the data as it allowed for the reduction of data into a manageable form ready for analysis. Content analysis is usually employed in study designs whose aim is to describe phenomena (Hsieh & Shannon, 2005). Content analysis made it possible for the investigator to distil words, phrases and the like into fewer content-related categories that were assumed to share the same meaning (Cavanagh, 1997). This method was aimed at attaining a condensed

and comprehensive account of the phenomenon, which resulted in categories describing the phenomenon (Krippendorff, 2012).

Content analysis was appropriate in this investigation because the researcher's interest lay in the description of the particular phenomenon being explored in this study. When analysing qualitative data, two types of coding are common, namely: manual coding and electronic coding (Basit, 2003). In this investigation, I employed manual coding as this technique enabled me to stay in touch with all of the data files, thus keeping me constantly immersed in the data. Coding involved reading through the notes, transcripts and repeatedly listening to the audio recordings until themes emerged as certain catchphrases, ideas and activities repeatedly occurred in the text (Brown & Holloway, 2008). Basit (2003) indicates that coding plays a significant role in qualitative data analysis as it is used to organise and making sense of such data.

The process of data analysis started with the transcription of all the digitally recorded interviews through typing and editing, and subsequently, data emerged as words or text (Bryman, 2006). The techniques of data preparation and transcription as espoused by McLellan, MacQueen and Neidig (2003) were employed in this study, in addition to their guidelines and instructions on transcript preparation, tracking and storage of digital audio recordings. Seven interviews were conducted in total with seven academics. I personally transcribed each interview and as I listened to the voices of the participants over and over, I reflected on my experience of the interview. This was instrumental in placing text emphasis on the experiences of the participants (Fontana & Frey, 2005). In the process, I took note of possible codes that emerged as units of meaning (Miles & Huberman, 1994).

Having completed the verbatim transcription of all of the interviews, I set my focus on cleaning the documents in terms of anonymity, printed these and delivered them personally to the participants for member checking (Creswell et al., 2007). This allowed the participants to verify the data in the interview transcript and also to make amendments in instances where they felt that the data was not correctly captured or where they wished to add to the conversation by divulging more details. Two of the participants involved responded, with one adding to the tools that he used for teaching and the other clarifying one of the comments he had given.

3.6.1.1 Data coding and categorisation

Coding has been advanced as a technique that permits researchers to group and organise closely coded data into categories or “families” since they share some characteristics (Lincoln & Guba, 1985, p. 347). As a qualitative investigator, the coding of my data was undertaken “both during and after collection as an analytic tactic, for coding is analysis” (Miles & Huberman, 1994, p. 56). Basit (2003, p. 145), however, differs by positing that “coding and analysis are not synonymous, though coding is a crucial aspect of analysis”. Charmaz (2006) opines that coding “generates the bones of your analysis [...] integration will assemble those bones into a working skeleton” (p. 45).

The data process was cyclical in nature. I started the coding process by reviewing the contents of the transcripts to get a general idea of the data (Henning & van Rensburg, 2004). Subsequently, a spreadsheet was employed to begin coding based on the research questions (Pope, Ziebland & Mays, 2006). Initial coding was followed by focused coding where two phases were adopted (Charmaz, 2008). In the first column of the spreadsheet, I inserted the questions that were posed to the participant. In the second column, the participants’ responses were captured and this column I labeled as the text column. I was keen on highlighting text that seemed to have relevance to my research question. Themes (theoretical categories) were arrived at *a priori*, acquired independently of experience (Saldana, 2012; Weitzman, 1999) and guided by the research questions. I noted these in the third column by scripting in the fringe of the text a phrase or keyword that I thought gave a rich description of the process of integrating ICT into the teaching practice of the academics using the research participants’ words.

This procedure was undertaken repeatedly for each of the participants. I constantly examined the subsequent transcripts to see if the codes identified in the first transcript were present; a process described as comparative analysis (Charmaz, 2008). Open coding was employed to add new codes that emerged (Saldana, 2012). The transcripts of each of the seven participants were compared (cross-case analysis) in strict adherence to the constant comparative analysis technique in order to yield a general list of all of the codes reflecting “recurring regularities” (Merriam, 1998, p. 181).

Through a constant comparative analysis method, the contents of each category were refined (working within) before I started comparing them with each other (working across) (Rubin & Rubin, 1995). The constant comparative method is also defined by Merriam (1998) as research

that begins “with a particular incident in the same set of data or in another set” (p. 159). The constant comparative method of data analysis is a comprehensive organisational data analysis procedure in which the researcher follows an approved format. Maykut and Morehouse (1994) explain that this format includes: (a) Reading and coding each data piece carefully, (b) Organizing each data piece into categories, (c) Comparing each new data piece to existing categories to determine whether the new data fit an existing category or fall into a new category, (d) Looking for emerging themes within each category, and (e) Repeating the process to find the most salient themes. This type of analysis is also known as inductive analysis (Patton, 1990). Inductive analysis allows categories “to emerge from patterns found in the case under study” (p. 44).

The data were compared with other data to identify similarities, differences, sequences, or causation (Hatch, 2002, p. 155) and this resulted in themes (Appendix F) that were later linked together to produce categories (Charmaz, 2006). In this phase, words that appeared across all of the participants’ interviews for particular responses were considered general themes and used as a quote in the report. These comparisons were performed throughout the data collection process as a way of collecting information and further data. The researcher made use of the constant comparative analysis with the participants’ observations, interviews and document reviews.

Inclusion and exclusion criteria have often been used in the qualitative exploratory studies of understudied phenomena to define, specify or even to understand the factor(s) of interest that make a certain element stand out or exist (Polit & Beck, 2008). This study made use of the inclusion and exclusion criterion to define each category as unique from other categories (Vandeyar, 2006).

3.6.2 Data analysis of the classroom observations

I made use of a video recorder to record the classroom observations of how the academics integrated ICT into their teaching practice and teaching methodology with emphasis on the ICT tools used and pedagogy of how they used these tools. The data acquired in the course of observing the participants served as a measure for reducing the subjective reporting of the participants’ beliefs and their actions. In this study, the analysis of video material that was obtained in the data collection was guided by Jacobs, Kawanaka and Stigler’s (1999) qualitative video analysis approach and was done through watching, analysing and coding. The videos

were watched, critiqued, analysed and then recorded as supplementary observation notes that were made on-site. Observational notes were also examined to ascertain whether there were any new emerging codes or categories (see Appendix B1).

3.6.3 Document analysis

Content analysis was applied in examining the occurrences and patterns in the documents (Stemler, 2001). The university's website, newsletters, Learner Management System, course outlines, ICT policy-related documents and ICT strategic plans were examined. Textual analysis, as espoused by Charmaz (2006), was used to place the analysis within the social context of the university. Charmaz's questioning technique was also employed in analysing extant text as a means of gaining insight into the "perspectives, practices and events not easily obtained through other qualitative methods" (Charmaz, 2006, p. 39) (refer to Appendix G for an example of the document analysis).

3.6.4 Researcher journal

I employed reflective writing (Thomas, 1995) in the course of this study by presenting and examining extracts from my research journal. The journal was useful in documenting and reflecting on my own understanding of the research process (Janesick, 1999). The research journal was subjected to a content analysis as an analytical technique usually applies to narrative data (Miles & Huberman, 1994, p. 9). Borg's (2001) 'product benefits' methodology was used in analysing the journal. The analysis process constituted the identification and labeling of reflective processes and searching for common sequences among them. This was done first by reading through the journal (see Appendix C).

3.7 Trustworthiness issues

The purpose of research is to create reliable and valid knowledge in a manner that is ethical. It is important for professionals in the fields of application, such as teaching and learning, to have trust in the research findings (Merriam, 1998; Neuman & Kreuger, 2003). Golafshani (2003) affirms that "to ensure reliability in qualitative research, examination of trustworthiness is crucial" (p. 601). I attempted to enhance the quality of the study by attending to the issues of credibility, dependability, transferability and confirmability of the research results (Creswell & Miller, 2000). When pursuing trustworthiness in qualitative studies, researchers attend to credibility, confirmability, transferability and dependability of the research results. These

trustworthiness issues (credibility, confirmability, transferability and dependability) have been used in other qualitative studies to describe different aspects of trustworthiness (Clandinin & Rosiek, 2007; Patton, 1990). Creswell (2009) opines that qualitative research derives its strength from truthfulness as it defines whether the results are correct from the standpoint of both the investigator and the participants. Consequently, the trustworthiness of studies of a qualitative nature can be improved by upholding a high degree of objectivity and credibility. Trustworthiness was significant in this investigation since candid information is necessary to put together a viable thesis. In the sections that follow, I elaborate on how trustworthiness was ensured in this study.

3.7.1 Credibility

A qualitative investigation is considered credible when the descriptions of human experiences presented are accurate to the extent that people who happen to share the same experience immediately take cognisance of the descriptions (Denzin & Lincoln, 2011; Krefting, 1991). Qualitative inquiries aim to provide quality information that is accurate, credible, and factual to the phenomenon under investigation. In qualitative inquiries, the investigator functions as the primary instrument of data collection and this necessitates that the investigator carefully reflects on, deals with, as well as states the potential sources of error or bias. For research to be credible there is a need for the investigator to stay impartial throughout the study period. In this investigation, I began the collection of data with no preset outcome theory. More so, I was dedicated to give an accurate account of the research findings with the intention of completely understanding the phenomenon under review.

To ensure credibility in this investigation, the researcher developed an early acquaintance with the culture of the university before collecting data. Channels of communication were also established, which was done through the consultation of the suitable literature, as well as preliminary visits to the university. The researcher also spent a period of six to ten months in the research field collecting data. This period of time was considered sufficient to have reached saturation point in the data collection, this gave the researcher an opportunity to immerse himself in the research field, allowing recurrent patterns to be identified and verified, thus ensuring prolonged engagement (Clandinin & Rosiek, 2007). Additionally, the research employed well-established qualitative research techniques (Yin, 2003). Yin advocates the use of “correct operational measures for the concepts being studied” (p. 34). The line of inquiry

employed in the data collection sessions and the techniques of analysing the data were those that have successfully been used before in similar investigations (Shenton, 2004).

The researcher also employed iterative questioning (Shenton, 2004) as a way of ensuring credibility in this investigation. This was accomplished by means of using probes to draw data of a detailed nature and also through iterative questioning. This is where the investigator returned to matters that were raised earlier by the participants and extracted data through rephrased questioning. In both scenarios where inconsistencies emerged, the researcher made a decision to discard the suspect data. The success of any study is hinged on believable input from the participants, and it is accordingly important that the investigator ensures that credibility is safe guarded so as to make this investigation rewarding and consistent with the raw data.

3.7.2 Dependability

Shenton (2004) argues that dependability is a phrase used in qualitative research to indicate that if the work were to be repeated in the same context, employing similar methodological approaches and with the same participants, the resultant information would be identical. Dependability also relates to obtaining similar results when the same action is repeated (Trochim, 2006).

A substantial amount time of time was set aside to plan for the interviews and to ensure that they progressed well and that they captured all of the vital data that was necessary to evaluate the participants' perspectives (Pickard, 2007). To address the concerns of dependability in this study, I maintained an audit trail, which explicitly detailed all of the processes through which the study results were arrived at. In this regard, I elaborated on the procedures that I used in data collection and analysis. Dependability was addressed more closely through the detailed reporting of the process followed in conducting the study, in so doing allowing prospective researchers to replicate the study, or even to obtain similar findings as those of this study (Lapan et al., 2011; Tracy, 2012). The researcher believes that the accurate transcription of the participants' interviews aided objectivity, rigor and ethical diligence (Jackson, Drummond & Camara, 2007).

3.7.3 Transferability

According to Merriam (1998), transferability in qualitative research is a term used when referring to the degree to which the findings of one study are applicable to other settings or circumstances. In this investigation, I provide a clear and distinct account of the research site, the selection process of the participants, in addition to a comprehensive explanation of the methods that were used to collect data so as to enhance the transferability of this study (Denzin & Lincoln, 2011). Holloway and Galvin (2016) aver that by providing a dense background information and a thorough explanation of the participants and the research context and setting, a researcher is able to enhance the transferability of the research findings. I employed constant reflexivity in an attempt to present findings that reflected the participants' experiences within the study context. This was key in conveying the real situation under investigation and, to some extent, the contexts that surrounded them (Shenton, 2004).

In this report, I provide elaborate and fitting descriptions for the readers to be in a position to arrive at informed choices regarding the relevance of the study's findings to particular settings or contexts (Lincoln & Guba, 1985). The essential details include descriptions of the setting so that differing interpretations or views can be deliberated on. In this case, direct quotes from the participants are provided. In addition, excerpts were used from the interview data as well as field observation notes to illustrate the process of developing themes from the data.

3.7.4 Confirmability

In this study, confirmability was employed to ensure that the findings were a product of the thoughts and experiences of the participants and that they were not attributes or inclinations of the investigator (Shenton, 2004). In applying the construct of confirmability, I employed the triangulation strategy. Accordingly, this study employed different data collection methods such as interviews, observation and document analysis as a means of ensuring confirmability. The purpose of using triangulation was twofold; for data confirmation and for data completeness (Casey & Murphy, 2009). The term confirmation refers to the "process of comparing data gathered from multiple sources to explore the extent to which findings can be confirmed" (Casey & Murphy, 2009, p. 6). When data collected through numerous techniques is established to be consistent, there is then an increase in the confidence and credibility of the research results (Casey & Murphy, 2009). Data completeness primarily involves bringing together several standpoints from a range of sources so than one can have a realistic picture of

the phenomenon being portrayed (Casey & Murphy, 2009). A key strength of the design of case study research is the opportunity to make use of various sources of evidence in the form of triangulation (Grove & Burns, 2005; Yin, 2003). Triangulation refers to making use of several data collection techniques in the same study to ensure that the weakness of one data collection method is compensated by the use of alternative data gathering techniques (Grove & Burns, 2005). Denzin and Lincoln (2011) agree and confirm this definition of triangulation.

For the purposes of confirmation, numerous data sources were used and compared to ascertain the degree to which the results in this study could be confirmed (Denscombe, 2007). A number of approaches for collecting data, namely, interviews, observation and document analysis were employed. For example, observations were conducted in the classroom to identify the tools that these academics used in their teaching practice. In the interviews, the participants were requested to deliberate on their opinions regarding the issues that facilitated or stalled the integration of ICT in their teaching practice. The similarity in the findings of the data collection methods used confirmed the study findings. Data completeness was primarily concerned with obtaining numerous viewpoints from different sources so as to have a complete view of the phenomenon that was depicted. Each method of data collection used had its own merits, and once used in combination with the others, increased the potential for a profound understanding of the case, as well as the context. Creswell and Miller (2000) have argued that researchers use validity procedures to search for convergence among numerous and divergent information sources so as to develop themes or categories in an investigation.

3.7.5 Audit trail

I ensured that there was an audit trail by detailing the decisions taken throughout the research process as a means of justification for the methodological and interpretive decisions that I made. This was a means to achieve research rigour. A detailed methodological account enables the reader to decide on the acceptability of the data and constructs emerging from the findings. Koch (2006) urges that while the interpretation of the readers may differ from that of the researcher, they should nevertheless be in a position to differentiate the means by which they have arrived at their conclusions. The audit trail is critical to this process as it gives the researcher the ability to follow up on each and every step of the research process and procedure described.

In order to assess the study's trustworthiness, it is important to delineate the steps that were involved in achieving the end product, in addition to presenting faithful accounts that resonates with readers (Horsburgh, 2003). In this investigation, I maintained detailed notes relating to the contextual setting of the data, the motivation, as well as the rationale for the decisions related to the methodology (Glaser & Strauss, 1967; Ryan-Nicholls & Will, 2009). Additionally, I make available all of the processes of documenting this study, the data collection, the collection instruments, and the data analysis in the relevant appendices (Sandelowski, 2000).

3.8 My role as the researcher

The role of a researcher is defined by incorporating reflexivity into a study so as to guard against bias in conducting the research (Surry & Land, 2000). I practiced reflexive reporting by informing the readers through a documentation of my actions, interests and experiences (see Appendix C) in order for them to weigh up my role in this study (Fossey et al., 2002). Reflexivity, as defined by Hatch (2002), is the researcher's ability "to keep track of one's influence on a setting, to bracket one's biases, and to monitor one's emotional responses" (p. 10). My role as a qualitative researcher is described ably by Glesne (2006) as that of a researcher as a learner. This role was well understood, and I was careful to tell the story of the participants and not my own.

I took care to avoid any form of bias by employing '*epoché*'. Patton (1990, p. 408) posits that *epoché* addresses the researcher's need to become completely aware of any personal bias and to ensure that he or she controls the bias with the aim of eliminating any preconceptions and gaining clarity. In this study, I was careful to separate or bracket my preconceived views about the integration of ICT by academics in their teaching practice (Fischer, 2009). This preconceived view allowed me to reflect on all aspects of the research procedure and findings.

3.9 Ethical issues

Any research is carried out in a setting that has its own common values, cultures, beliefs, population, and identities. Researchers that engage in qualitative studies are sometimes ethically conflicted arising from the fact that their studies may necessitate, to some extent, the involvement of the researcher in the participants' lives. Since the academics were observed while teaching, issues of appropriateness, accuracy, skills and professionalism were brought to

the surface. The researcher paid special attention to this research to ensure that all of the ethical issues were addressed and to minimise the harmful consequences and exploit the advantageous effects thereof (Silverman, 2013). In order to guard against harmful consequences, several ethical issues were considered in the course of this study. Prior to conducting the study, the researcher acquainted himself with the ethical procedures for conducting research as presented by Guillemin and Gillam (2004), Lock, Wells and Farthing (2001), and Patton (1990).

3.9.1 Permission to conduct the study

I requested permission from the university authority before contacting the potential participants. Clearance was sought from the ethics committee at the Faculty of Education, University of Pretoria before embarking on data collection from the field through a process called procedure ethics (Guillemin & Gillam, 2004). After securing the necessary certificates and permission, I then made contact with the prospective participants. All of the participants in this investigation were consenting adults (older than 18) and did not belong to any group that was considered vulnerable.

3.9.2 Informed Consent

Those that agreed to partake in this study were required to sign a letter of informed consent in which all issues such as the right to withdraw, anonymity and data storage were presented. The respondents were briefed on the research endeavour in order for them to be as objective as possible, even when no sure technique is known to control objectivity. Informed consent documents were also used to convey data relating to the research focus, purpose and process, including the time allocated to the subject, as well as the risks and benefits of this study. The participants were informed of their right to participate or withdraw at any time (see Appendix E). Additionally, this study scientifically acknowledged and recognised all authors represented in the literature consulted in order to avoid bootlegging. Informed consent was obtained first from the university administration and then from the selected participants prior to data collection. All research parties were briefed on the context and purpose of the investigation. The participants were assured of their anonymity and that the data collected would be safe guarded in the most secure manner and would only be used for the purposes stated in their consent forms. Convenient times were agreed upon regarding when the interviews and observations would be carried out without causing any disruptions in the academics' scheduled classes.

3.9.3 Privacy, confidentiality and anonymity

Sin (2005) asserts that getting participants to sign a consent form and securing procedural approval alone are not adequate to guarantee that the procedure and products of the investigation are executed and concluded in an ethical manner. Permission to use the participants' words verbatim in presenting the findings of this investigation was also sought. The names of the participants and the research site were kept confidential and were known to the investigator and the study supervisor only. The participants' responses were securely kept on a password locked computer saved with a code totally different from their known names. In the course of the transcription and the subsequent use of excerpts from the participants in the report, pseudonyms were used to disguise the real identities of the participants (Halai, 2006).

3.10 Limitations of the study

Limitations are important in establishing the boundaries and exceptions inherent in a study (Creswell, 2012; Creswell et al., 2007). In any given study, limitations allow the researcher to identify what might have weakened the findings of the study. The limitation of this investigation is based on the fact that it used only one university. This therefore means that the findings from this investigation cannot be generalised to all HEIs. However, this study was not aimed at generalising the findings but rather to give insight into the experiences of these academics in their integration of ICT at a university in Uganda. This gave me leverage to study their cases in depth as it was not my intention to unearth an absolute truth or universal law that applied to all academics in Uganda.

It may be difficult to maintain a completely bias-free study given the researcher's intimate involvement as the main tool of data collection in this investigation. However, the researcher was constantly cognisant of this close involvement and how it could bring in his own views and values to the investigation as he interpreted the views of the participants. I thus employed 'bracketing' (Ahern, 1999) in an effort to set aside my assumptions and influence in order to elicit the reflected experiences of the respondents. Creswell et al. (2007) find that all qualitative researchers bring values to a study and, as such, they must recognise the value-laden nature of data collected from the field.

3.11 Conclusion

This chapter commenced by outlining the research design used in this study. I then discussed both the meta-theoretical and the methodological paradigm that informed this study. I presented the rationale for selecting a qualitative inquiry using a case study and narrative approach to conduct the study. I subsequently discussed the research instruments, how the data collection was executed, analysed, as well as tested for validity and reliability. The ethical considerations are also discussed. The data analysis methods that were adopted in this study were also presented, thus setting the stage for the next chapter, which presents the research findings.

CHAPTER 4

FINDINGS

4.1 Introduction

In this chapter, I present and illustrate the main results of this study. In the sections that follow, the findings are consolidated and discussed according to the themes that emerged from the academics' responses, classroom observations, as well as an analysis of selected documents. The interviews and classroom observations conducted served to explore how academics integrated ICT into their teaching practice. I present the themes that emerged from the data analysis process and propose a discursive analysis and interpretation of these findings. The academics' responses regarding ICT integration in their practice and their classroom experiences were my primary focus. The coding process emanated from multiple readings of the interview transcripts. My field notes and the inscriptions in my researcher journal were used to corroborate the analysed data. As discussed in Chapter 3, content analysis was used as a tool to analyse the collected data. By using this analysis method, I was able to identify the major themes as these emerged from the captured data. In this section, I also present the words of the interviewees as verbatim quotations to underpin the themes and sub-themes. Inclusion and exclusion criteria were used to define each category as unique from other categories. The table below presents the emergent themes in the order in which they are discussed in the following sections.

Table 4.1: An overview of the emergent themes

Theme	Categories
4.1 Current pedagogical practices in terms of ICT	4.1.1 Reliance on proprietary software 4.1.2 The ambivalence towards a Learning Management System (LMS) 4.1.3 A shift to Web 2.0 technologies for teaching and learning 4.1.3.1 Social Media: Facebook as an interactive learning resource <ul style="list-style-type: none"> • Facebook as an LMS • Facebook as a live broadcast tool 4.1.3.2 Social media: Blogs <ul style="list-style-type: none"> • Blogs as collaborative spaces • Blogs as a form of reflective practice 4.1.3.3 Social media: Freeware messenger apps as communication tools: WhatsApp
4.2 ICT paradigm shift: changes in teaching practice	4.2.1 The evolving pedagogical role of academics 4.2.2 ICT catering to various learning styles 4.2.3 Perceptions of changing students' attitudes
4.3 ICT as a catalyst for professional development	4.3.1 Academics' self-appraisal of their ICT skills 4.3.2 Learning through self-study 4.3.3 Systemic training and support
4.4 Perceived challenges in ICT	4.4.1 Lack of access to ICT for teaching and learning 4.4.2 Infrastructure and technical support services 4.4.3 Resistance to change: The lack of positive attitudes towards ICT use 4.4.4 The lack of institutional ICT policy and supporting guidelines
4.5 Perceived opportunities in ICT	4.5.1 The will to change: beliefs and attitudes of the ICT agents of change <ul style="list-style-type: none"> 4.5.1.1 Enhancing 21st century skills 4.5.2 The ubiquity of ICT

4.2 Current pedagogical practices in terms of ICT

In this theme, I report on how academics were using ICT tools, such as proprietary software and emerging Web 2.0 technologies such as social media in their teaching practice. The technology tools available on the internet are often referred to as Web 2.0. Web 2.0 technologies refer to a set of internet technologies and services that aim to enhance creativity, allow for the secure sharing of information, enhance collaboration, as well as improve web functionality as we know it. These technologies allow users [academics] not only to retrieve information, but also to co-author the data on a Web 2.0 site and exercise control over it. These sites have an "architecture of participation" (Barsky & Purdon, 2006, p. 65) that encourages users to add value to the application as they use it. A good number of these tools can be used by academics and are freely available. Web 2.0 tools are beneficial in many ways, one being that they can easily be accessed from any computing device with internet connectivity.

The interviewees' narratives highlighted the tools that they used and how they used them in their practice. The academics nominated technologies such as Learning Management Systems (LMSs) like 'Moodle' and social media tools such as Facebook, YouTube, Blogs and WhatsApp. They further voiced their concerns about the effectiveness of these technologies and the extent to which these have improved their practice. This theme highlights the emergent technologies that are being adopted by academics at this university to cater to the 21st century learner. This theme consists of three categories in which I glean and interpret the accounts of the academics and their involvement in the integration of ICT in their teaching practice. They were requested to comment on the tools that they used and how they used these tools.

4.2.1 Reliance on proprietary software

"PowerPoint makes it possible for me to bring the world to my classroom"

Table 4.2: Inclusion and exclusion criteria in terms of reliance on proprietary software

Inclusion criteria	Exclusion criteria
In this theme, I exclusively considered the use of Microsoft Office as proprietary software.	This theme does not include Free software; public domain software; open source software or any other software.

The academics that I interviewed narrated how they made use of 'proprietary software tools' in their teaching practice. All seven of the academics indicated that they were using ICT as a

tool for preparing and organising their lectures. Pankaja and Raj (2013) clarify that “proprietary software is computer software licensed under the exclusive legal rights of the copyright holder” (p. 3). This implies that a company or individual acquires rights of an exclusive nature to that piece of software, thereby denying other parties access to the program’s source code and the ability to study, modify or even copy the program. Six of the academics interviewed indicated that they were using computer software that were readily available through institutional licenses like Microsoft Office Suite to do this. Many felt that although the propriety software was not designed for educational use, it has considerable educational potential. The academics recounted the use of Word processing programs (like Microsoft Word) to create lecture materials and course assignments; spreadsheets (like Microsoft Excel) to analyse classroom performance, and presentation applications such as Microsoft PowerPoint to create slide shows for their classes. Many believed that through the use of propriety software tools, students experienced an immediate connection between knowing and doing. This meant that the students were not only knowledgeable but were also in a position to apply this knowledge in the real world.

The academics integrated audio clips and still images into their PowerPoint presentations as visual aids and for auditory stimulation to evoke critical thinking from the students and to stimulate class discussions. Wakukyalo, who has described herself as someone that is passionate about cooking and travelling, has been teaching at this university in the Department of Leisure and Hospitality for over eight years now. She narrated how she used technology such as PowerPoint and particular websites to deliver her presentations:

Well, for now, I only use the [data] projector to show pictures because there are some concepts in tourism no matter how you explain, a student cannot get it. They have to see these pictures, like for instance, I prepare PowerPoint presentations about leading tourist destinations in Europe, Spain, the beaches, the architecture, you have to show them those things. Then, like, sustainable tourism, there is a website I had to show them first to see how these people practice sustainability but normally I use a projector and my personal computer (Interview transcript-Wakukyalo).

Wakukyalo shared her experience in stating that, “*PowerPoint makes it possible for me to bring the world to my classroom by incorporating videos or animations [visual multimedia] in a way ... it enhances new learning.*” This academic’s statement highlighted the importance that she attached to making learning as “natural” as possible using the available technologies. This

was so that that her students would easily relate to and understand when they either watched or viewed the images of their environment, which she incorporated into her presentations. She explained that illustrations like videos and graphics that incorporate colour and can be adapted in the classroom augment “academic’s ability to convey concepts and enhance student learning.” She believed that the quality of the illustrations should improve learners’ depth of understanding. This ensures that more classroom time and energy can go into explanations instead of chalkboard or flipchart illustration, which takes much longer to do than computer graphics, and is less accurate.

Makyati, a human resources lecturer with over eight years of teaching experience, reported that in addition to using PowerPoint in his teaching practice, he also incorporated videos usually sourced from YouTube in his presentations to enrich his class material. He believed that this enabled students to understand certain topics better. To this academic, the internet was viewed as a rich source of course material that he could use in his teaching practice.

Ahhhhh ... Normally, I create PowerPoint presentations. Sometimes with YouTube videos on particular subjects. Sometimes I go to YouTube and get illustrations so that students can understand better (Interview transcript - Makyati).

Makyati has taught human resource management-related courses for the undergraduate and postgraduate degree programmes from when he first joined as a teaching assistant. When we talked, he was quick to describe himself to me as a person who is not charmed by technology and someone who has not been eager to use the “bells and whistles” of technology in his teaching. Makyati was of the view that good teaching is something that requires substantial thought and effort. He seemed convinced that technology was simply a new tool that may or may not be very supportive, depending on how one chooses to employ it. When I visited one of his human resource classes, he played a video animation of what happens in a typical boardroom to give his students an insight into the “real world” (see Figure 4.1).

Makyati believed that visual aids, such as the one below (Figure 4.1), played an important role in ensuring that the students understood the subject matter and that it also allowed them to cover the right amount of content in the planned session time.



Figure 4.1: Enriching course material with video presentations: screenshot of a video from one of Makyati's sessions (<https://www.youtube.com/watch?v=oPhKhTI0Lss>)

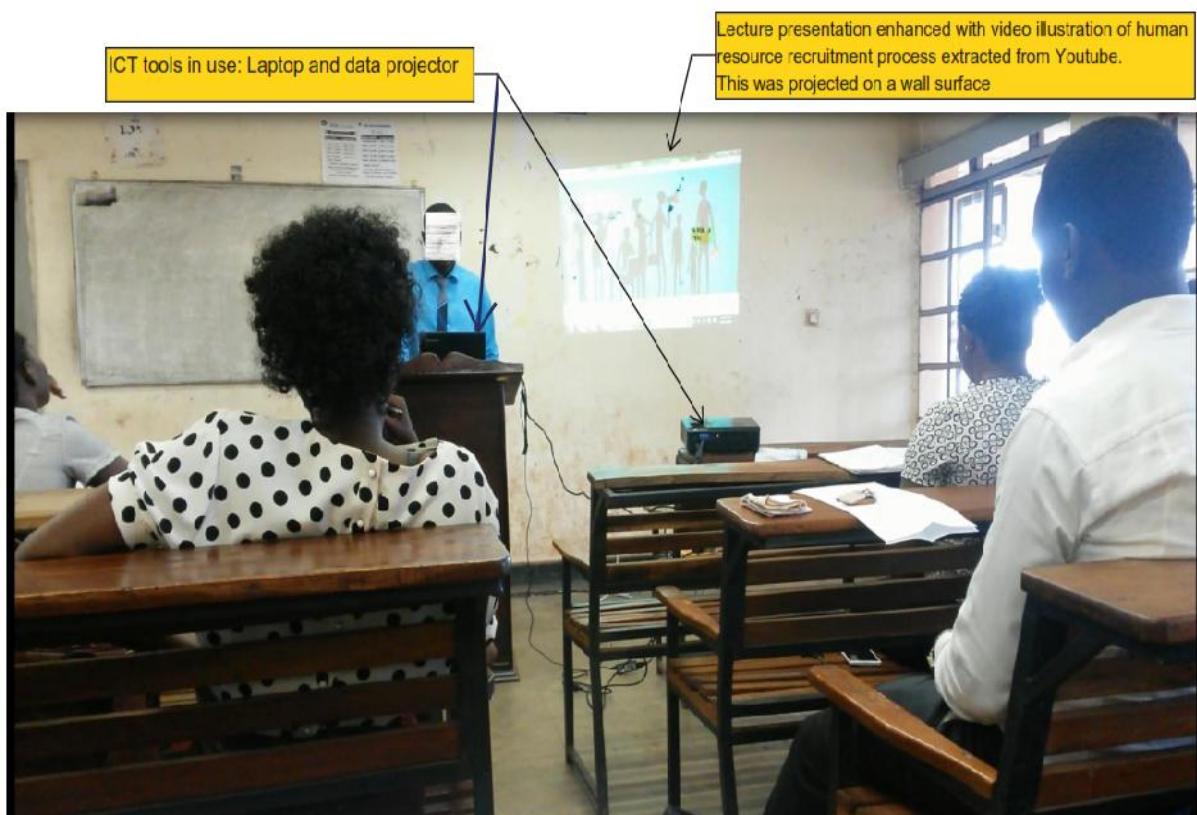


Figure 4.2: Makyati enriching class material with content extracted from YouTube to give a visual illustration of the human resource recruitment process

The goal of locating and creating new PowerPoint slides was to re-vamp the course and bring concepts to life in the classroom. Like the majority of the academics in this study, Makyati described the texts for this course as often very dry, technical and difficult for students to understand. The new slides were designed to enable the academic to illustrate the conceptual units and thus enhance classroom learning. He described the PowerPoint slides that he planned to use in his course as offering significant improvement over prior teaching tactics because these would provide better presentations with cleaner slides, using colour and graphs to show stimulus and results. New materials that incorporate, for example, rich illustrations can also be easily displayed with newer technology. These demonstrations could now be done in the classroom much more effectively than the very awkward traditional approaches that he used before.

The academics in this study believed that presentation software was key in the delivery of course material that involved more than text. Magufuli, one of the youngest senior lecturers at this university (based on the available data from the human resource department), described how he made use of Microsoft PowerPoint to create class presentations. Additionally, he indicated that he used word processing programs (such as Microsoft Word) to create lecture materials and course assignments. Magufuli indicated that sometimes it necessitated that he made voice recordings that would benefit those who had missed attending his face-to-face classes.

Sometimes I use it [ICT] as a tool, like when using a data projector and a laptop for class presentations using PowerPoint and then sometimes when I want to make an illustration, sometimes I record my face-to-face sessions using a digital [voice] recorder. So, students who miss the face to face sessions have an opportunity of listening to the digital recordings of our face-to-face interactions so as to catch up on what was covered in their absence (Interview transcript- Magufuli).

Loketo, a lecturer from the department of Business Computing discussed the many ways in which he integrated ICT into his teaching practice. He seemed to say that he incorporated ICT in different ways depending on the type of topic or curriculum. Loketo mentioned how he relied on proprietary software in his teaching practice:

One, I develop PowerPoint presentation slides, and then I employ Liquid Crystal Display (LCD) projectors to enable me project these slides to the students in my classes. Secondly, for the practical class we have hands on sessions in the computer labs. Third, I try to encourage students to go and do their own research on the internet (Interview Transcript – Loketo).

The data from the interviews indicates that the academics not only made use of ICT to deliver [present] material in their classes, but many of them also made use of Microsoft Word software to prepare hand-outs in the form of notes or even case studies for their classes. This is evidenced in Makyati's statement:

If I want to pass on some information, notes [course material], case studies, I use easily available applications like Microsoft Word (Interview transcript - Makyati).

Additionally, the classroom observation notes showed that some of the academics would take website URL links paste the information in Microsoft Word documents. Then they processed the information and used it as additional class material. Magufuli mentioned that he used and encouraged his research students to use Microsoft Word because:

It saves students the hassle, it is also easy to archive the comments (from the lecturer) because they keep them in soft copy even when submitting publications for review it not only helps them to track changes made in the document, but also the progress. (Interview Transcript - Magufuli).

The academics indicated that using Microsoft office allowed them to develop PowerPoint presentations, making it possible to cover more course content in a class session than they did when relying on the chalkboard, flip charts and overhead illustrations, both of which took more of their time to display. In fact, one of the academics was worried about sometimes moving along too quickly for the class so he tried to pay attention to not overwhelming them with rapid delivery. The remarks of one of the academics reflects the sentiments of many of the participants in this group:

Yes, it does in terms of being able to cover what I have to cover within a limited period of time and also in terms of showing students what I want to show them visually (Interview transcript - Musomesa).

The efficiency of the technology-enabled displays allows coverage of more material due to saving time in class. The academics also indicated that LCD-displayed slides that carry outlines and notes kept the lecture organised and focused. Additionally, they also provided clarity for the students and kept them focused on the concepts rather than on attempting to capture lecture points in their own notes. For most of the academics in this study, PowerPoint replaced what used to be a lot of chalkboard time in relaying key information, notes and illustrations.

It was noted in this study that the majority of the academics interviewed were converting their hard copy lecture materials, or “yellow notes”, to PowerPoint slides that they could use in their class rooms. Six of the academics indicated that they were using software that was readily available like Microsoft Office to do this. One of the academics had this to say.

Ahhhhh, I integrate ICT of course using some computer program that are easily available like Microsoft Word, if I want to pass on some information, notes, case studies, I use such programs, MS Excel, I use it to process results of students (Interview transcript - Makyati).

Some of the academics stated that they used office application packages to manage class records, for example, students’ grades in different assignments and exams were tabulated using Microsoft Excel. Some of the academics said that they would print these results with the students’ registration numbers and pin them on the notice boards for the students to access. They further claimed that they processed the students’ exams on their own using office application packages (setting, typing, editing, and proofreading).

The majority of the academics in this study found the use of proprietary software rewarding. The technology allowed them to enrich their sessions by embedding images, videos and illustrations in their presentations, a practice that they believed enabled their students to understand the course content more easily. The act of entrenching multimedia in their presentations was believed to help learners appreciate learning by seeing real-world events with which they could associate. This was true with majority of the lecturers, who made use of Microsoft PowerPoint. Similarly, the academics felt that the use of ICT provided them with the means to enact their pedagogical beliefs. Technology allowed them to carry out their practice more efficiently without reading word-for-word during their presentations as the students had the ability to see what was being discussed using a projector.

4.2.2 The ambivalence towards Learning Management Systems (LMS)

“When you incorporate technology [LMS], life becomes easy, teaching becomes easy... and this provided a bad experience for me ... so I hardly think about using it [LMS] on a regular basis”

Table 4.3: Inclusion and exclusion criteria for the theme of LMS

Inclusion criteria	Exclusion criteria
In this theme, I exclusively considered the use of web-based platforms that encouraged dialogue and the active participation of the students. This enabled the lecturers and students to share materials, to submit and return assignments and to communicate online.	This theme does not include websites that were not specifically created to allow lecturers and students to share, submit and return assignments.

Several of the respondents in this study unanimously agreed that their continued engagement in online exchanges between themselves and the students had provided various ways for them to scaffold learning. For example, one of the academic would email their students reminding them of the approaching take-home submission deadline or even creating a platform for students to brainstorm over a particular topic that will be tackled in the subsequent class session.

Most of the participants in this study recounted the use and influence of LMS in their teaching practice. LMSs are some of the technological innovations that have been adopted by academics at this university to support the delivery of their curriculum. Lonn and Teasley (2009) explain that, “Learning Management Systems (LMSs) are web-based systems that allow instructors and or students to share materials, submit and return assignments, and communicate online.” Some of the academics believed that the LMS simplified most of their tasks in ways that made teaching and learning more streamlined, systematised and organised. However, the data analysis also indicated that some of the academics felt that the LMS did not add much to their teaching and learning practices and that, if anything, it only made the whole teaching and learning process more complicated, giving academics more work in addition to working for longer hours.

The academics that attempted to make use of the university's LMS (Moodle) were cognisant of the need to change the way in which they facilitated their classes. A majority of the participants in this study began by adopting the LMS for the management, dissemination, and retrieval of course materials. It seemed to me that as their familiarity with the technology increased, they began to make a limited use of many of the interactive features offered by the LMS for teaching and learning, which was one of the ways in which they used this system to facilitate active learning. Those in support of the LMS, like Magufuli, viewed the LMS as a tool that supports innovative approaches to teaching and learning. This academic argued that the LMS was key in facilitating discussions and communication in his courses and that it would soon become an important part of his teaching process. He also noted that he used the LMS as a platform to collaborate with his colleagues. Magufuli highlighted what he was able to do using the LMS:

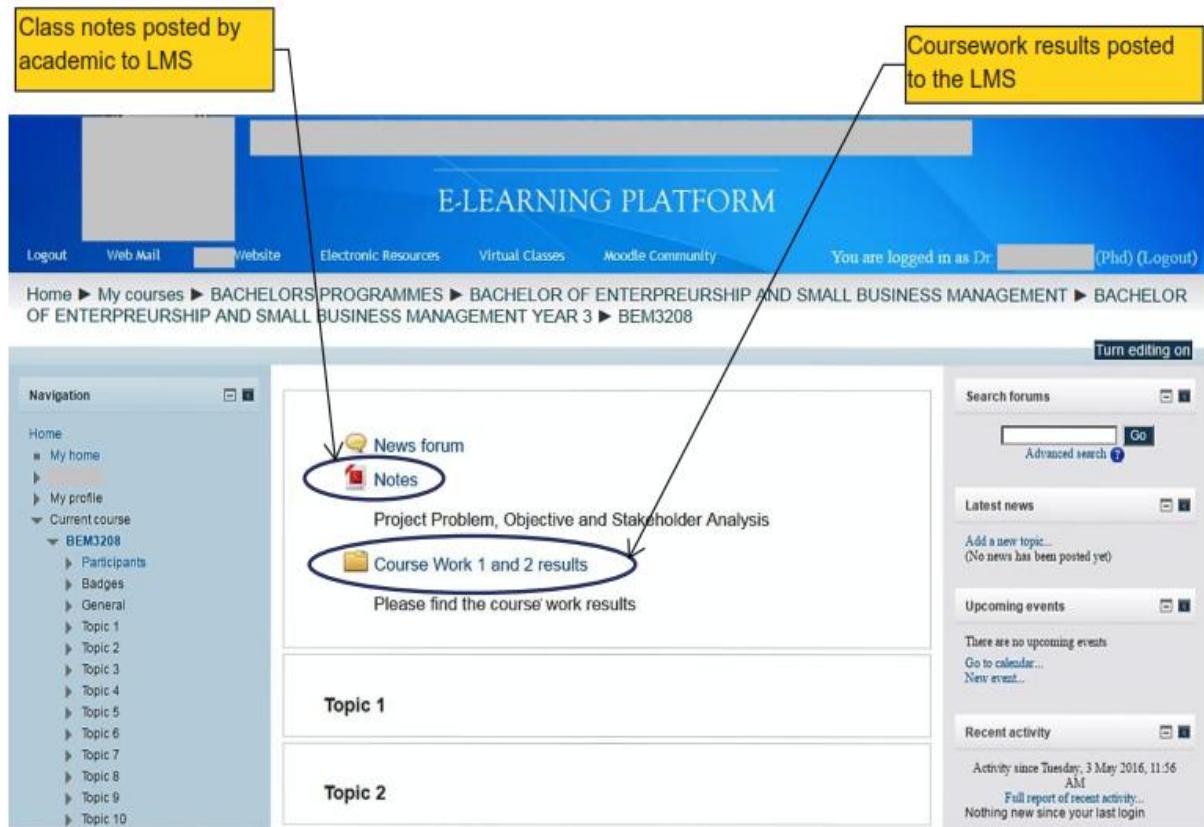
It is possible for me to do presentations, have separate chats during presentation, and have audio ... all on the LMS. I can have discussions about certain topics with fellow colleagues and even with students and it is easy to archive for follow up. And one of the most significant things is that the academic has control over student material and the direction of the discussion (Interview transcript - Magufuli).

From the conversation with this academic, it is clear that he perceived the LMS as a comprehensive platform where he could interact and share information with both students and colleagues in numerous ways. The LMS was not only used for the delivery of course content and communication by this lecturer, he also indicated that he used it for administrative activities that were closely linked to student control of the courses that he facilitated. This academic described the importance of the LMS as a tool that he used to manage his courses in stating that:

When students are submitting assignments, they do so online [LMS] and then when I want to give submission deadlines, the incorporation of ICT is to limit the time available so that when the deadline comes the system automatically rejects further submissions (Interview transcript - Magufuli).

The e-learning platform depicted in the screen shot below (Figure 4.3) allowed the academics to create and upload material to their online profiles. Students were enrolled by the lecturers for courses that they taught, which made it possible for the students to access the course material in the form of notes and coursework. This act simplified communication and interaction between the lecturers and students. The LMS interface was structured in such a way

that it had a navigation pane on the left side of the window, with uploads appearing at the centre of the window. This screen also incorporated a news pane to alert students to new postings or announcements about their courses on the LMS.



The screenshot shows the University of Pretoria's e-learning platform interface. At the top, there is a navigation bar with links for Logout, Web Mail, Website, Electronic Resources, Virtual Classes, Moodle Community, and a user profile indicating 'You are logged in as Dr. [redacted] (Phd) (Logout)'. Below the navigation bar, the page title is 'E-LEARNING PLATFORM'. The main content area displays a course structure under 'BACHELORS PROGRAMMES > BACHELOR OF ENTERPREURSHIP AND SMALL BUSINESS MANAGEMENT > BACHELOR OF ENTERPREURSHIP AND SMALL BUSINESS MANAGEMENT YEAR 3 > BEM3208'. On the left, a 'Navigation' sidebar lists 'Home', 'My profile', 'Current course' (expanded to show 'BEM3208', 'Participants', 'Badges', 'General', 'Topic 1' through 'Topic 10'). The main content area contains several sections: 'News forum' (with a link to 'Notes'), 'Project Problem, Objective and Stakeholder Analysis' (with a link to 'Course Work 1 and 2 results'), 'Topic 1', and 'Topic 2'. A sidebar on the right titled 'Turn editing on' includes sections for 'Search forums', 'Latest news' (which is empty), 'Upcoming events' (empty), and 'Recent activity' (empty). Two yellow callout boxes with black outlines point from the text above to specific elements: one points to the 'Notes' link in the 'News forum' section, and another points to the 'Course Work 1 and 2 results' link.

Figure 4.3: Screen capture of e-learning platform (LMS).

Magufuli used the e-learning platform to post class notes and coursework results for one of his courses in the Bachelor of Entrepreneurship and Small Business Management programme.

Mukyala used the LMS mainly for communication purposes with her students. Additionally, she also indicated that the LMS was useful in managing coursework assignments since students sometimes used it to send their completed course work assignments for assessment. She pointed out that the LMS was a useful tool to support and supplement the teaching process. This academic indicated that the LMS made it easy for her to interact and engage in discussions with her students, as evidenced in her statement:

I use it to send and receive communications, comments between me and the students... on some occasions, I use it as an avenue to discuss with my students' pertinent issues and in other cases I want to check on their involvement in the course on the LMS (Informal conversation - Mukyala).

The academics also felt that the LMS was a tool that was bound to enhance the teaching and learning landscape. For example, Twatoba, a senior lecturer in the Department of Procurement and Logistics, indicated that this tool provided a platform for collaborative teaching and learning, student to lecturer discussions, and student to student discussions. Although the use of the LMS was relatively new to him, he praised the platform and explained that it had numerous benefits for academics like himself, as well as his students:

I do not incur costs moving from one campus to another because I can conduct my lectures online via the LMS. I can also use various media like integrating audio and visual to deliver my lectures through the LMS which makes students understand faster and saves me time. (Interview transcript - Twatoba).

This lecturer's statement points to the online convenience that the LMS platform provided the academics. He also appreciated the LMS' ability to handle multimedia content, which was significant in enriching his delivery sessions, thus making it easier for students to understand the curriculum.

Twatoba alluded to the fact that the LMS facilitated e-learning and when it was used, classes were scheduled conveniently and more easily to the benefit of both the lecturer and students. This lecturer believed that use of the LMS allowed him to engage in other productive activities other than spending valuable time on setting up class meetings, which became possible when using the LMS:

It is convenient for me and the students and that means less face-to-face interaction with students as this can be arranged through the LMS, it is possible to schedule class discussions ... and this saves you the time wasted doing "leg work" when trying to set up or agree on an appropriate meeting time ... so it's a good thing. It is convenient for me as well as the students (Informal conversation - Twatoba).

The majority of the academics shared the view that the LMS was instrumental in the delivery of course material and the administration of their courses. They indicated that this platform also played a major role as far as saving valuable time was concerned, which was used more productively elsewhere.

Musomesa appreciated the convenience and ease that came with the use of the LMS and felt that the integration of LMS was important to his teaching. He seemed to suggest that his

motivation for adopting the learning platform resulted from the convenience it offered, regardless of the distance between him and his students. He expressed his views as follows:

It has been a significant change to me, with time I have realised that when you incorporate technology [LMS], life becomes easy, teaching becomes easy, I tried to explore this online teaching [LMS] with students in our up country centres² [distance learning campuses] and I found it remarkable that I could teach students say in Arua centre [476km away] when am in Kampala, using the online platform, though it's not also very stable, given the unreliable internet and low bandwidth but today when I incorporate ICT, I see that I can be more effective (Interview transcript - Musomesa).

This lecturer indicated that the use of the LMS eliminated the need to periodically travel to other centres, along with the associated costs. Musomesa felt that even with the poor internet connectivity (low bandwidth), the LMS provided relief for him in that he did not have to travel to conduct face-to-face classroom sessions since the platform made it possible to have the classes online.

The narratives of the academics centred on the use of the LMS mostly to facilitate course content delivery and discussions. However, they noted that course structure and academic preferences were determinants of the topics that would be discussed on the LMS. On many occasions, the academics started and encouraged students to be part of the discussions on the LMS either as part of their course assignment or simply for learning purposes. Loketo, a computing lecturer with significant experience in the use of ICT mentioned that he uploaded tutorials and exercises on the platform, and encouraged the students to register on the platform and be part of the on-going discussions.

I also encourage them [students] to discuss using the LMS. Sometimes we give exercises [assignments] that are done online [submission] and graded online [feedback] (Interview transcript - Loketo).

Loketo believed that if the students engaged in online (LMS) discussions frequently, they would be in position to understand the course content better since they would have an opportunity to consult both the academics and their fellow students.

² A university campus located relatively far away from the main campus. These are also called outreach centres because they are meant to bring education services closer to the people.

Even though many of the academics were supportive of the use of the LMS for teaching and learning, some academics had their reservations and contrary experiences. Magufuli felt that the LMS had not yet altered his teaching practice. He complained that it took longer to accomplish tasks that were meant to be easy. Just like Magufuli, Makyati believed that the use of the LMS had no significant effect on the teaching process. He was of the opinion that apart from communication, the LMS did not have much to offer, as expressed in his statement below.

It only enables more interactions with the students prior to and after their classes ... other than communication, the LMS has made no significant effect to the course ... as for the teaching process, I don't see much of a difference (Informal Conversation – Makyati).

Musomesa was supportive of his students initiating and having discussions on the LMS, although he felt that this was not always possible given that the LMS seemed to create additional administrative work that he was not prepared for. The additional time required by this lecturer to prepare for activities on the LMS discouraged him from always working with this platform. He argued that although the LMS was a good initiative that was bound to have an impact on teaching and learning practices, it came with additional requirements that were unwelcome.

Yes, I encourage my students that it's feasible to engage in these discussions. However, it is challenging since it requires that I spare some time to be available for the discussion with the students, it means I have to scale down on the other activities like research supervision ... Time is usually the biggest challenge I would think, there is too much administrative work that is not about to go away any time soon and all this eats up on my research time. The LMS simply escalates administrative work yet there is no commensurate benefit that comes with the increase in work load and time (Informal conversation - Musomesa).

Musomesa also explained that a disadvantage of the LMS was that students occasionally participated in such discussions only if it was mandatory for them to do so and a grade was awarded for participation. He was of the opinion that the students did not see the need to get onto the LMS if they had other options to participate in class discussions. They did not want to concern themselves with the “complexities” of the technology.

They [students] are reluctant usually and often many hardly post anything to the platform ... only when a course work score is attached do we get to see some tangible input, reason being that if they don't participate then it is likely that they will get a poor grade, or worse, fail ... however, when the choice is theirs to make without any form of compelling, they will not make any effort (Informal conversation - Musomesa).

Other academics, like Wakukyalo, also indicated that they had made a number of attempts to open online discussions with students on the LMS for a number of courses that they taught in an effort to stimulate debate, but felt let down by the platform because of its inaccessibility as a result of malfunctioning and low bandwidth. Wakukyalo could not hide her frustration with the LMS and thus stated her concerns as follows:

Students do not participate that much ... and this provided a bad experience for me ... so I hardly think about using it [LMS] on a regular basis. It [LMS] is on and off. Sometimes you are not sure if it is working and therefore students will use it as an excuse for not completing their online assignments (Interview Transcript - Wakukyalo).

Wakukyalo worried about being sure that the technology used would not disappoint at the hour of need. She also felt that the LMS was unreliable because it was still under development and required a lot of time to use. She stated that she preferred other already established avenues like webmail for communication with her class. Her poor experiences with the LMS forced her to abandon this system and resume traditional teaching practice.

The LMS in place is not user friendly. Many times am motivated by something that is friendlier, convenient and reliable than something that is complicated and unreliable ... The time I wanted to use it, I was not able to send the message to my students and I kept asking why is it so ... I don't know if it is efficient or notbut I hardly use it any longer for the reason that it failed to work the time I wanted to use it, am stuck to just dealing with my students face-to-face (Interview Transcript - Wakukyalo).

Wakukyalo was not the only one with this dilemma as Loketo also indicated that logging into the LMS platform required patience and many times resulted in wasted time:

In order to login into the LMS, users need to be very patient since it takes a long time the time spent when logging into the system is too much and this discourages many would-be users (Informal conversation - Loketo).

The majority of the academics in this study expressed a range of positive and negative sentiments, including frustration and pressure in the course of adopting the LMS. The presence of an LMS provided relief to some academics in the form of easy scheduling and delivery of classes. They envisioned the LMS as a platform that would be instrumental in organising their teaching and learning practice as it had many functionalities embedded that related to class management. The fact that it was new to them and still required many improvements did not discourage them from using it for the delivery of course material and discussions to a limited

extent. Their (lecturers) statements also indicate that some of them were not happy with the tool. They raised concerns related to technological issues that could have proved to be a steep learning curve. These involved managing the LMS software, dealing with unreliable internet connectivity in addition to the need to convert existing study material content to formats that were compatible with the LMS. Notwithstanding, the majority of the academics valued the potential of the LMS to support the teaching and learning at this university through communication, collaborations, as well as discussions.

4.2.3 A shift to Web 2.0 technologies for teaching and learning

Table 4.4: Inclusion and exclusion criteria for Web 2.0 technologies for teaching and learning

Inclusion criteria	Exclusion criteria
In this theme, I exclusively considered web-based applications that feature user-generated content and emphasised interaction, community and openness such as blogs; Facebook; YouTube; wikis; social bookmarking; and WhatsApp.	This theme does not include applications that are of an asynchronous nature.

The academics had varied beliefs and perceptions with regard to the significance of using social media technologies in teaching and learning. Social media was being used by academics in several ways, notably for collaboration, information sharing and communication, among others. The narratives of the participants shed some light on the thoughts and beliefs of the academics in regard to what constituted social media and how they used it in their teaching practice as a communication tool. Social media websites, also known as Web 2.0 technology, have been referred to as virtual communities that make it possible for people to creatively express themselves, collaborate and interact with one another on a specific subject or to simply “hang out” online (Dabbagh & Reo, 2011; Murray & Waller, 2007). There was a general feeling among the academics that these technologies had great promise for teaching and learning since they were web-based and free. Their ability to support interaction and collaboration is something they highlighted as important in enhancing students’ learning experiences. The participants discussed the use of Facebook, blogs, twitter, WhatsApp and LinkedIn, among others, as a supplementary resource to face-to-face (classroom) for teaching

and learning. The academics also considered YouTube as a form of social media given that people could post feedback in the form of written comments or videos in response to posts.

4.2.3.1 Social Media: Facebook as an interactive learning resource.

Facebook has been put forward as a representation of spaces of affinity (Gee, 2004) where both lecturers and students can acquire both social and communication skills in addition to actively participating in the culture of Web 2.0 technology. The integration of various media to deliver course material to university students is becoming predominant. Web-based tools that are often associated with blended learning (such as email, blogs, podcasts) are being used by many universities the world over (Irwin, Ball, Desbrow & Leveritt, 2012). Universities' desire to provide a web presence for course delivery and to assist in the management and organisation of courses has pushed universities to design systems that will give students an opportunity to engage with fellow students and lecturers alike, and also enrich the quality of the students' learning experience through interactive learning. However, there are suggestions that these developed systems often lack an element of social connectivity and personal profile spaces that today's learners are familiar with (Mazman & Usluel, 2010). The prevalence of popular social networking sites such as Facebook has reignited the debate on the value of course-integrated LMSs.

- **Facebook as an LMS**

“So, if of course someone [student] is going to do an assignment on Facebook or the internet, they are more prepared to do it than sit in the library and flip pages.... yah.”

The participants' comments on using Facebook focused on touch points with small classes and peers. Facebook was mainly used for group (class) communication and discussion purposes. Typically, the academics created Facebook group pages and invited students at the beginning of the semester to join these groups. In this instance, issues relating to particular courses were posted by the academic or students and could be seen by both parties. The academics could join in the conversation on any of the topics posted either by themselves or by the students. The majority of the academics focussed on creating discussions that related to topics that were covered or were about to be handled in their courses. Others posted information about

university events, job opportunities, conferences, as well as links to material that supplemented current topics in class.

The screenshot in Figure 4.4 was taken from one of the numerous Facebook group pages created by Loketo for his class. It shows how he used Facebook to deliver course material to his students. This material took the form of supplementary notes (LAN Access Control Methods) or it was uploaded as a class project (ENAM project 2014) that would require the students to work on it in groups. The information on the page also indicated that this material was uploaded to the e-learning platform (LMS), most probably to ensure that whatever technologies the students accessed, they would not miss out on this information. This may also point to the fact that Facebook as a platform is not an official way of disseminating course material or interacting with students.

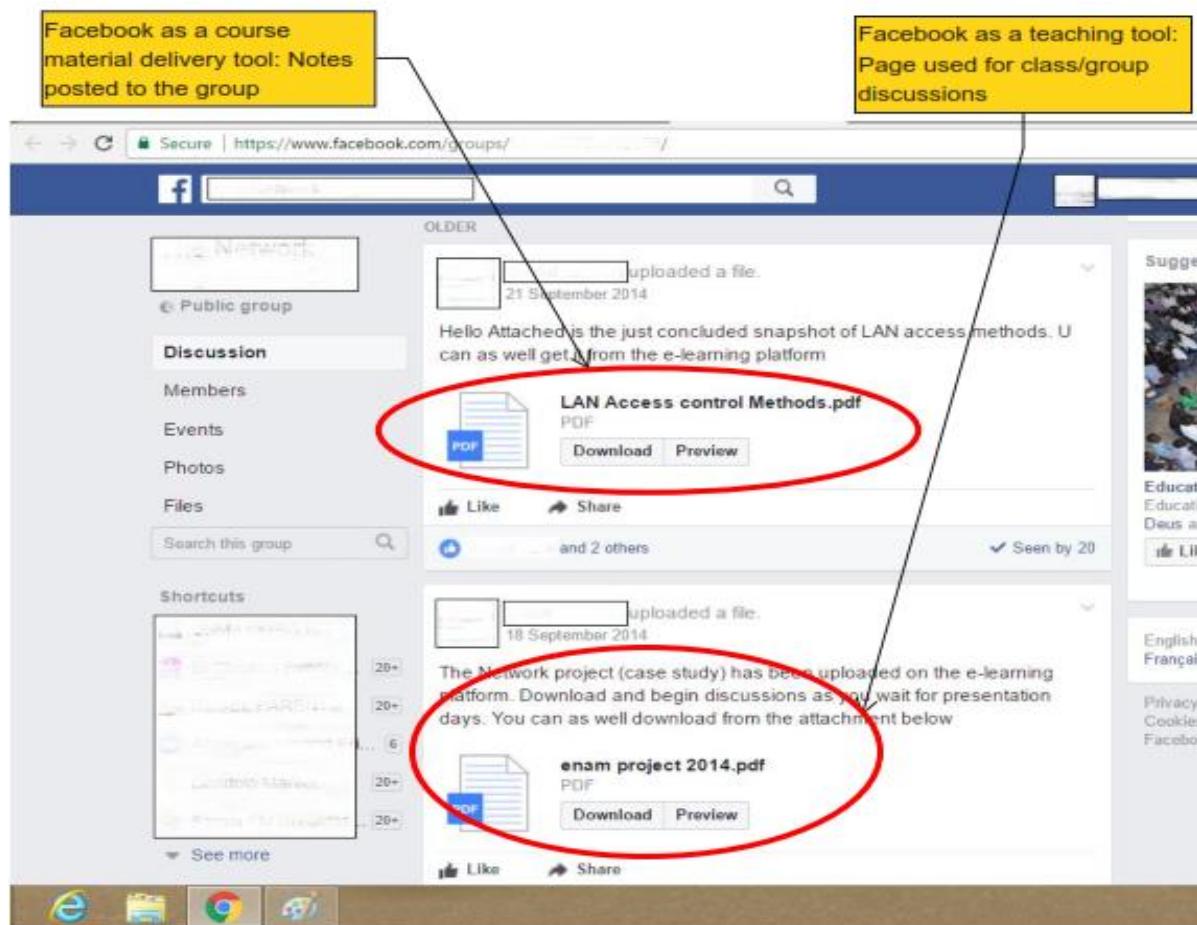


Figure 4.4: Facebook as a delivery tool: Loketo created the Network group page to share and discuss course material with his class

Magufuli, one of the academics who had facilitated a project management course was kind enough to share with me how he used Facebook in his teaching practice. He created a group for his class, largely for discussion and communication purposes, and invited students to the group. He would often post relevant material to this group page and members would in turn comment on the topic under discussion. He explained that Facebook groups were effective if the number of students was small:

Sometimes I create Facebook group pages for each of my classes, where I post notes and then we have interactions, especially for smaller classes (Interview Transcript - Magufuli).

There was a particular group that had approximately 40 enrolled students (as evidenced in the screenshot below in Figure 4.5), many of whom were active members. Magufuli indicated that members were free to post relevant material to the group page. This technology also allowed members to create group events (discussion sessions) where the lecturers and students would log on at agreed times and share ideas on the topics being presented. The discussions that took place in this group were meant to enrich the members' understanding of topics of interest and this was carried out in a setting that was both friendly and participatory. He indicated that, occasionally, unresolved online issues or matters that were of interest would resurface in face-to-face class interactions for further discussion.

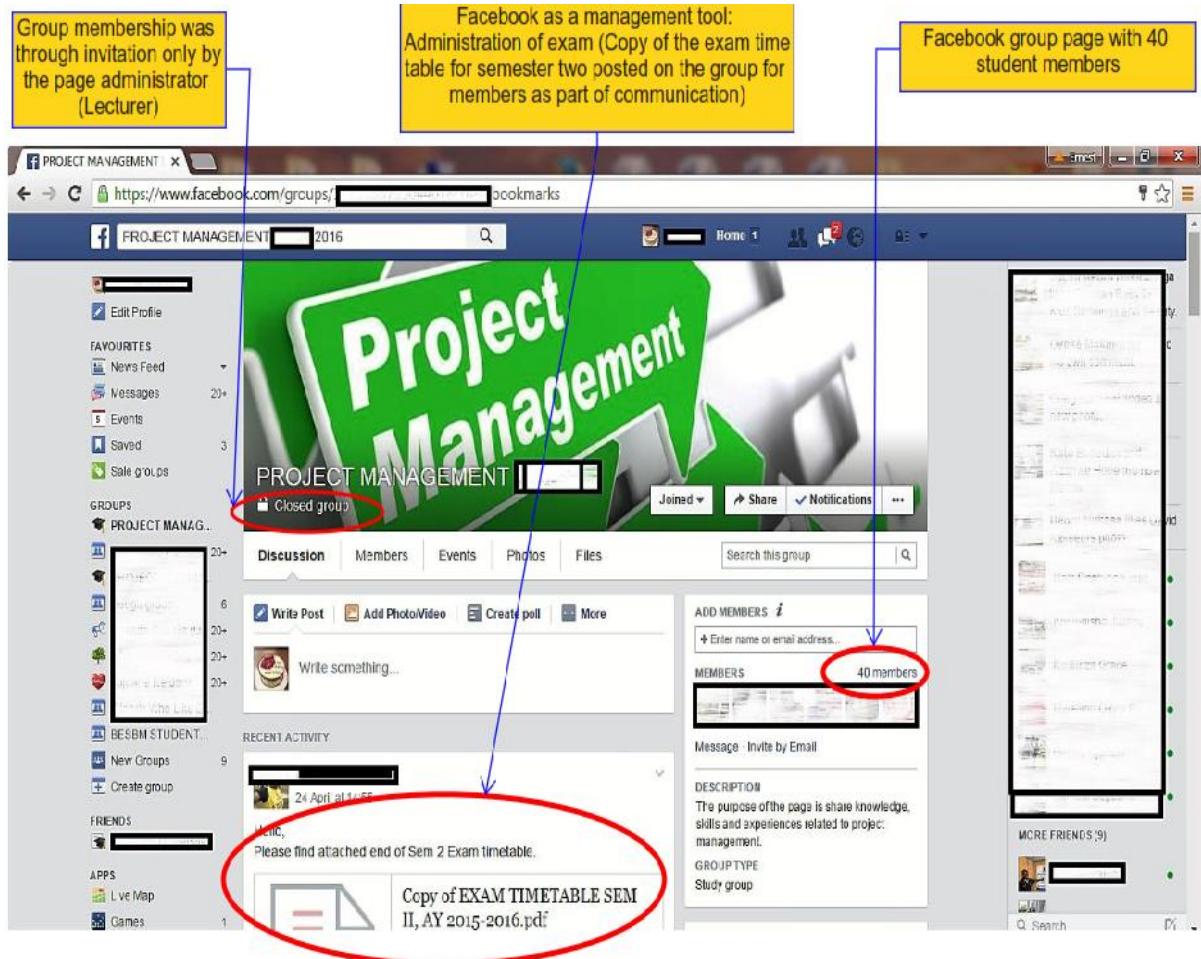


Figure 4.5: Social media tools: Facebook Group (page created by Magufuli for his project management class)

Academics, like Wakukyalo, were convinced that interactions between themselves and students could be improved on or reinforced with available social networking tools. Wakukyalo, a firm believer in the transformational potential of technology, shared her experience of how she made use of Facebook to enhance teaching and learning. She was convinced that social media promotes student activity and interest.

Yes... sometimes I just tell them to go to the library and read, or go to Google and find this subject or go to Facebook and look at this page and tell me A, B, C, D. So, if of course someone [student] is going to do an assignment on Facebook or the internet, they are more prepared to do it than sit in the library and flip pages yah (Interview transcript - Wakukyalo).

Loketo, an academic from the Department of Business Computing, also employed Facebook as part of his teaching and learning repertoire. He explicated that there was a particular group of third-year undergraduate students in the enterprise networking class that he described as

very active on his Facebook page. He noted that although many of them [students] were not keen on asking questions during the face-to-face classroom interactions, he could always tell from the online discussions on the group page whether a particular subject area was understood or if the students required support in the form of additional examples or case studies. This seemed to indicate that the online Facebook platform allowed for more student engagement, enquiry and interest, as evidenced by the number of active members (25 students) when the screen shot was taken (see Figure 4.6). This particular group had a total of 112 students who took part in different online discussions. They used the group page to broaden their understanding of the computer networking field, and also used it to post job opportunities that they came across in this area.

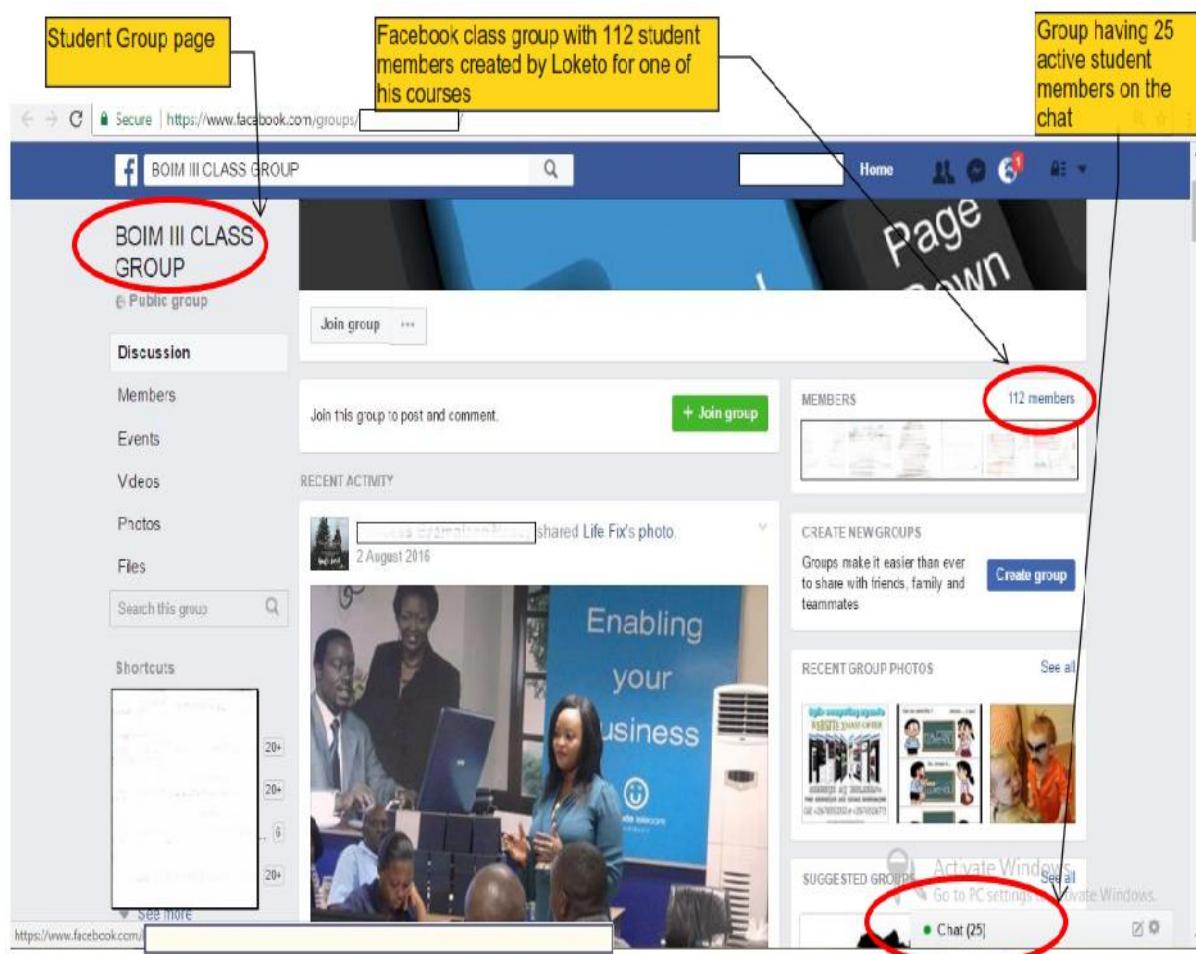


Figure 4.6: Facebook discussion group created by Loketo for one of his networking classes

- **Social media as a live broadcast tool: Facebook live**

“I was quite nervous the first time ...I started streaming... ohhh my God! I shouted to myself, it works! It works!”

The interactions with the academics revealed that some of them had adopted a new form of teaching and learning practice through the use of social media to engage with their students. Facebook Live is a video streaming service that allows subscribers to reach out to friends, groups and associates through live broadcasts. The data obtained revealed that some of the academics had embraced the use of Facebook Live in their pedagogical practice, as evidenced in their narratives.

Mukyala is one of the academics that felt comfortable with the use of social media in her teaching practice. She believed that the proliferation of networking technologies and software tools presented an opportunity for academics to make use of streaming digital video in their teaching and learning practices. This academic indicated that she had previously used the WebEx tool (“multi-functional Video/Audio Conference web application that allows you to meet with anyone, anywhere, in real time from your office or home, as long as you have Internet access on your computer or have the WebEx mobile app installed for your smart phone”) to stream videos as part of her class teaching. However, with the spread of social networks, she found it easier and more convenient to use features such as Facebook live to communicate with her classes. Her narrative depicts that she was reluctant to make use of this technology for the first time owing to the fact that she was not certain of what it was capable of and that she was not sure whether her students would embrace it as a new form of course delivery, as indicated in her statement:

I have so far engaged my classes using Facebook Live about three times now, of course, just like with any technology, I kind of find it more convenient. I was quite nervous the first time I tried it since it was quite different from the WebEx tool that I had used before. I had agreed with the class [students] on the time I would go live on Facebook and surprisingly 20 students out of a class of 43 were logged in when I started streaming... ohhh my God! I shouted to myself, it works! It works! From the reactions in form of comments that were scrolling over the screen, I could sense the excitement from my students as well. It was a whole new experience for many of my students, even for me (Interview transcript -Mukyala).

Another academic from the faculty of computing and management science also indicated that he had used the Facebook Live application for some of his computing-related classes. Loketo

argued that the majority of the students were appreciative of this form of synchronous teaching and learning. He confessed that it was through the request of some of his students that he tried out the Facebook live feature for his classes and that it had slowly become part of his repertoire in engaging with the students.

By the way, for your information, in one of our face-to-face class interactions one of the students asked, “why don’t we use Facebook Live for some of our discussions since we are business computing students?” That’s how I picked interest and asked how many of them had Facebook accounts and would be able to join the conversation in case we agreed on the session time. I was overwhelmed by the numbers that positively responded to this, about 70% of the students’ present responded in the affirmative. And so I tried it out (Interview transcript - Loketo).

This lecturer’s statement indicates that although he was aware of the technology, he had never considered using it in his teaching practice until he was prompted by some of his students to try it out. This could point to the fact that students live in distinctly different realities from those of their lecturers, who may not typically be motivated to use these technologies. Since the students used these technologies in their social circles (with peers), they saw it as an opportunity to engage the lecturer using the same technology.

The screen shots below (Figure 4.7) were taken from one of Loketo’s Facebook Live streaming sessions. The students were appreciative of the synchronous broadcast and the comments made varied from those that thanked the academic to those that complained about the poor internet connection. These comments popped up during the live broadcast and if they (students) sought the academic’s elaboration on a particular issue, he would immediately address the concern. However, it is important to note that even after the broadcast had ended, students were able to post comments after watching the video and sometimes the academic would answer their questions by replying to these concerns. From the comments, it was clear that the students liked this new approach to course engagement using modern social media features. One of the logged-in students indicated that they would watch the lesson again since he [student] had joined the broadcast a bit late. The live streaming sessions sometimes lasted an hour and a half but many times did not go beyond one hour.

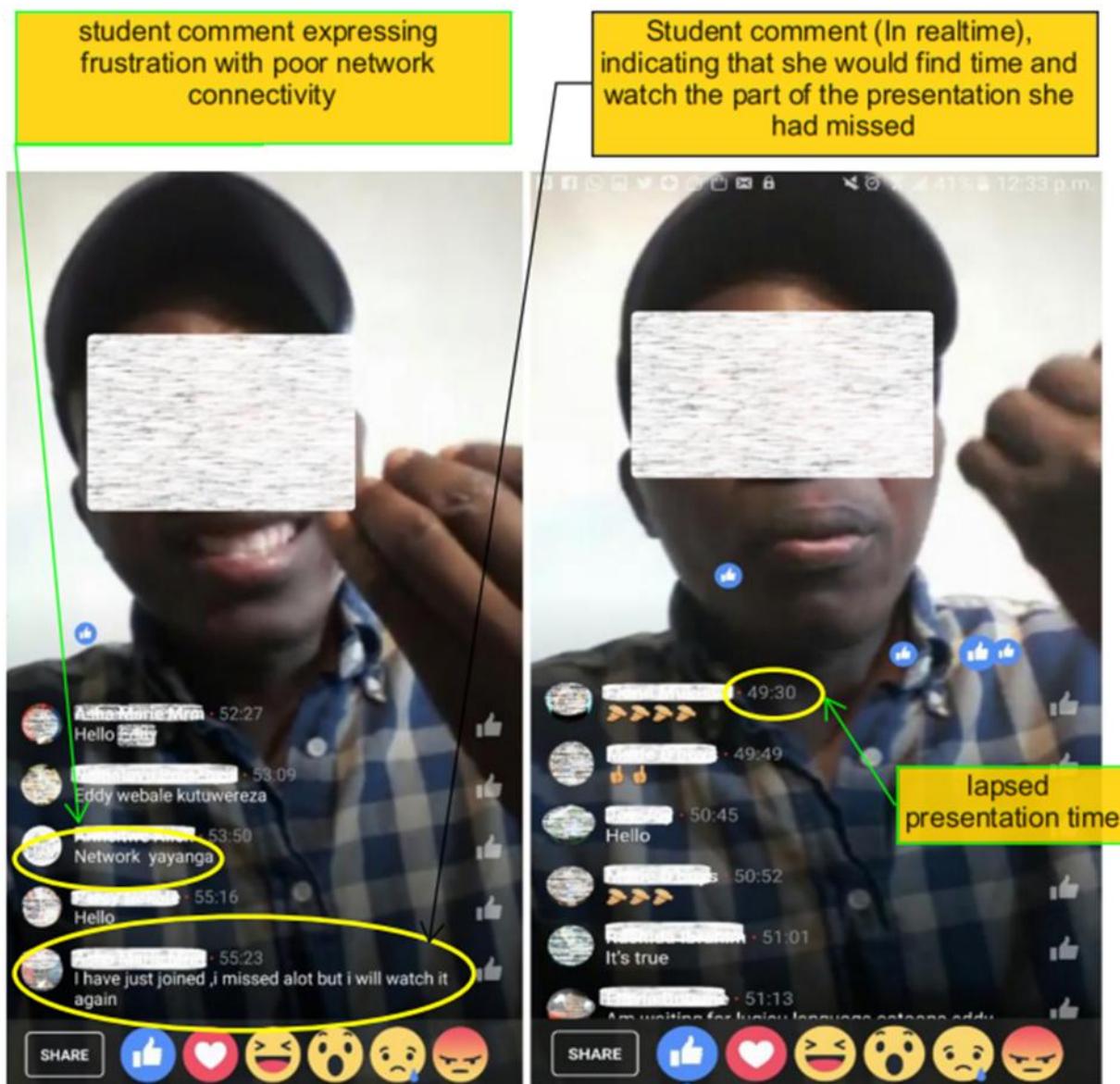


Figure 4.7: Facebook Live screenshots: Loketo using this streaming video feature to discuss some of the topics in his subject

Mukyala indicated that streaming media such as Facebook live could help students understand complex concepts that may be difficult to explain in the traditional setting, which may entail only text and graphics. This academic expressed enthusiasm over the use of this social media tool. She felt that students were appreciative of its use and this was quite evident in the face-to-face classes that followed the live stream. She noted that students were of the opinion that she should make use of the Facebook live feature more often as it was a convenient medium of engagement since it was conducted in a more relaxed environment away from the formalities of a classroom setting.

Significantly, Mukyala stated that the Facebook live sessions after her first experience attracted a larger number of students who actively participated in the live broadcast mainly by clicking on emoticons such as a “thumbs up” or “the heart” that she later got to interpret as “like” or “love”. The students also raised a number of subject-related questions, as well as unrelated questions in relation to the topic of systems analysis, which was being discussed in this live session. The unrelated questions were of concern and the academic expressed her worry regarding this mode of delivery.

The students think that they have an “open cheque”, they think just because you are not in the same room they can ask you anything, even the issues that are not related to the topic at hand. They hide behind their smart phones and Facebook and bombard you with all kinds of questions...you know! Sometimes I tell them off. But again this Facebook Live is new to all of us, I don’t want to sound rude. It may discourage them from participating. I want it to be as orderly as the face-to-face interaction. I am yet to find a better way to do this (Interview transcript - Mukyala).

The comments by this academic allude to a new experience of working with technologies that were unfamiliar to her. There was a clear indication that Mukyala was still learning how to make the best use of this synchronous social media technology feature for online lessons and therefore was cautious not to create a bad experience for herself and the students. This academic suggested that there is a need for lecturers to be tolerant, especially if they are still exploring such new technologies. Seemingly, she did not have difficulty with the technology or the transmission of the subject matter. Even though she did not appreciate the level of discipline in her online sessions as compared to the face-to-face classes, Mukyala tried to be tactful whilst at the same time trying to encourage participation. She was determined to persevere to make this form of teaching and learning work better.

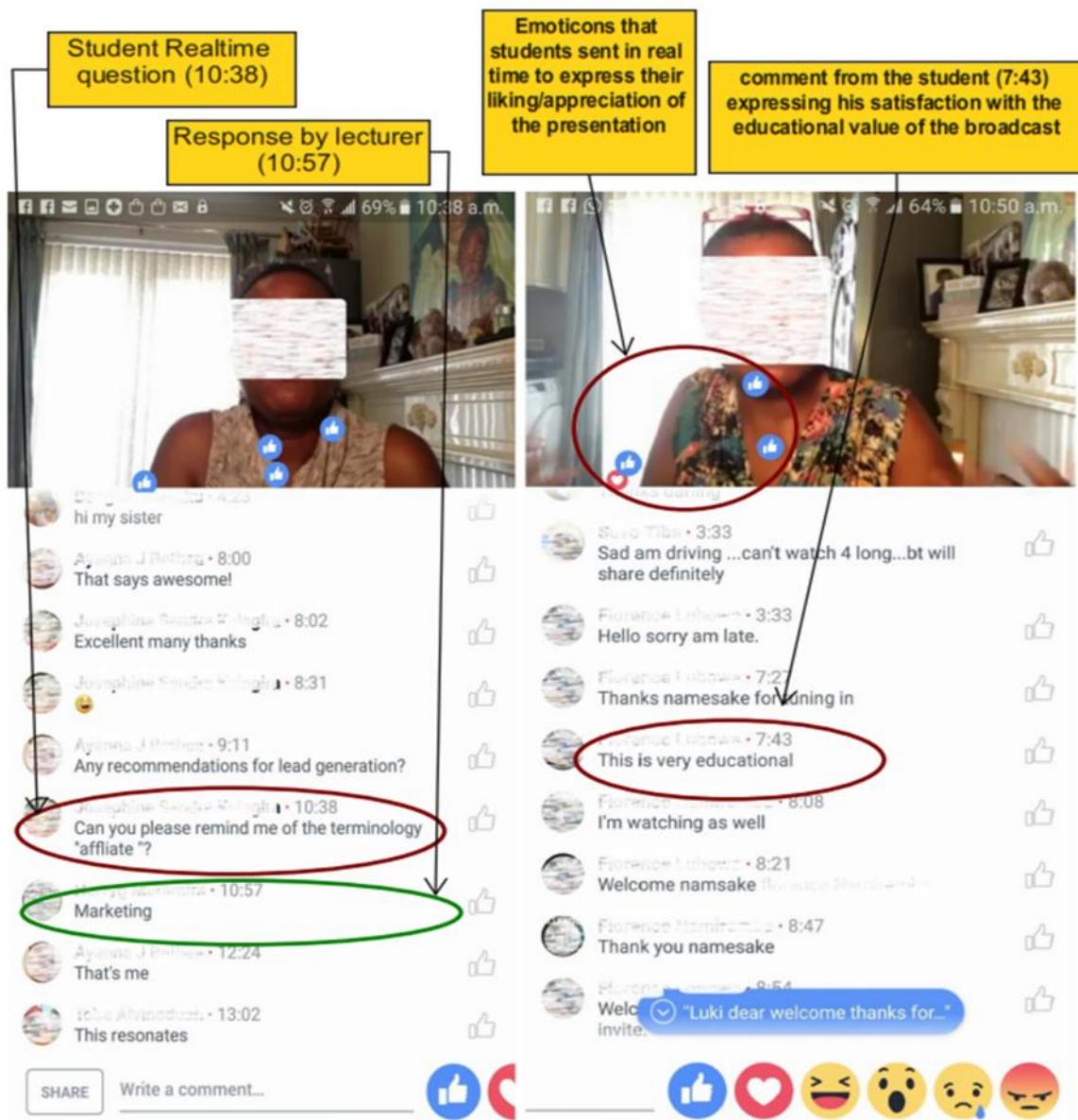


Figure 4.8: Screen shots from Mukyala's Facebook Live broadcast on electronic business showing real-time comments from the students that were watching

In her pursuit to use Facebook Live in teaching and learning, Mukyala was not comfortable with using her personal Facebook account to stream the course content to her students. This was challenging since her audience was not entirely made up of students, and comments also came from acquaintances that were not the target audience of this broadcast. Many followers appeared lost based on the casual comments (hi sister) reviewed by the academics, which did not further the objective of this broadcast (See Figure 4.8). Additionally, this academic indicated that she was disturbed by the fact that the students used pseudonyms (not their

registered names) for their Facebook accounts, which made it very difficult for her to track their progress or participation in the live broadcasts.

I do not know who is who. The names that I see in the online conversations are quite unfamiliar, sometimes am able to make out the faces, but on other occasions there is no proper identifier for the students that are logged in, its challenging ... its complex! But I cannot force them to put their actual names, they have their reasons (Informal conversation - Mukyala).

Analysing the statements of this academic, it would seem that she was sometimes uncomfortable with the anonymous behaviour of her students during the live broadcasts. She also felt that students using aliases (code names) was a precursor to online mischief. She preferred that the students log in with their known credentials, which would make it easy for her to know who was tuning in to her broadcast. However, she noted that this mode of teaching provided a friendlier environment, which encouraged students to inquire about different areas that they may not have understood during the face-to-face lessons or simply that they were not comfortable raising in those particular classroom sessions. Mukyala explained that:

The subsequent Facebook Live sessions were more organised and more engaging; the students had done some research and were able to make relevant comments. Comments made were diverse, even though some still came from areas that we had covered earlier on in the semester. They were still relevant to the issues under discussion. I could feel that students were interested in the ongoing conversation, although majority simply commented with “Thank you!”, “Great!”, “More examples” ... and a few other comments that were sometimes ambiguous for me to respond (Interview transcript - Mukyala).

The students' excitement over the use of Facebook live seemed only to be constrained by the bandwidth causing the streaming video to buffer due to poor internet connectivity. Mukyala noted that this happened for all of the occasions on which she used the Facebook Live service for her teaching. However, the students were patient and seemed to tolerate the poor connectivity environment and circumstances in which these sessions were conducted, as explained in the excerpt below.

The biggest challenge has been the freezing of the streaming videos in the course of the presentation. I would immediately see comments from the students saying, “we cannot see or hear you”, “looks like there is a network problem” and many others that highlighted the poor connectivity at the time. Also, students wanted to have a copy of the video shared but somehow, I could not locate or download it for sharing (Interview transcript - Mukyala).

Although internet connectivity was affected by poor bandwidth, the students still found this medium of instruction interesting and informative. In Figure 4.9, the students' comments such as "you answered my question in this episode", "what a nice idea" and "thanks for the self-audit lesson" suggest that this mode of teaching was appreciated by the students.

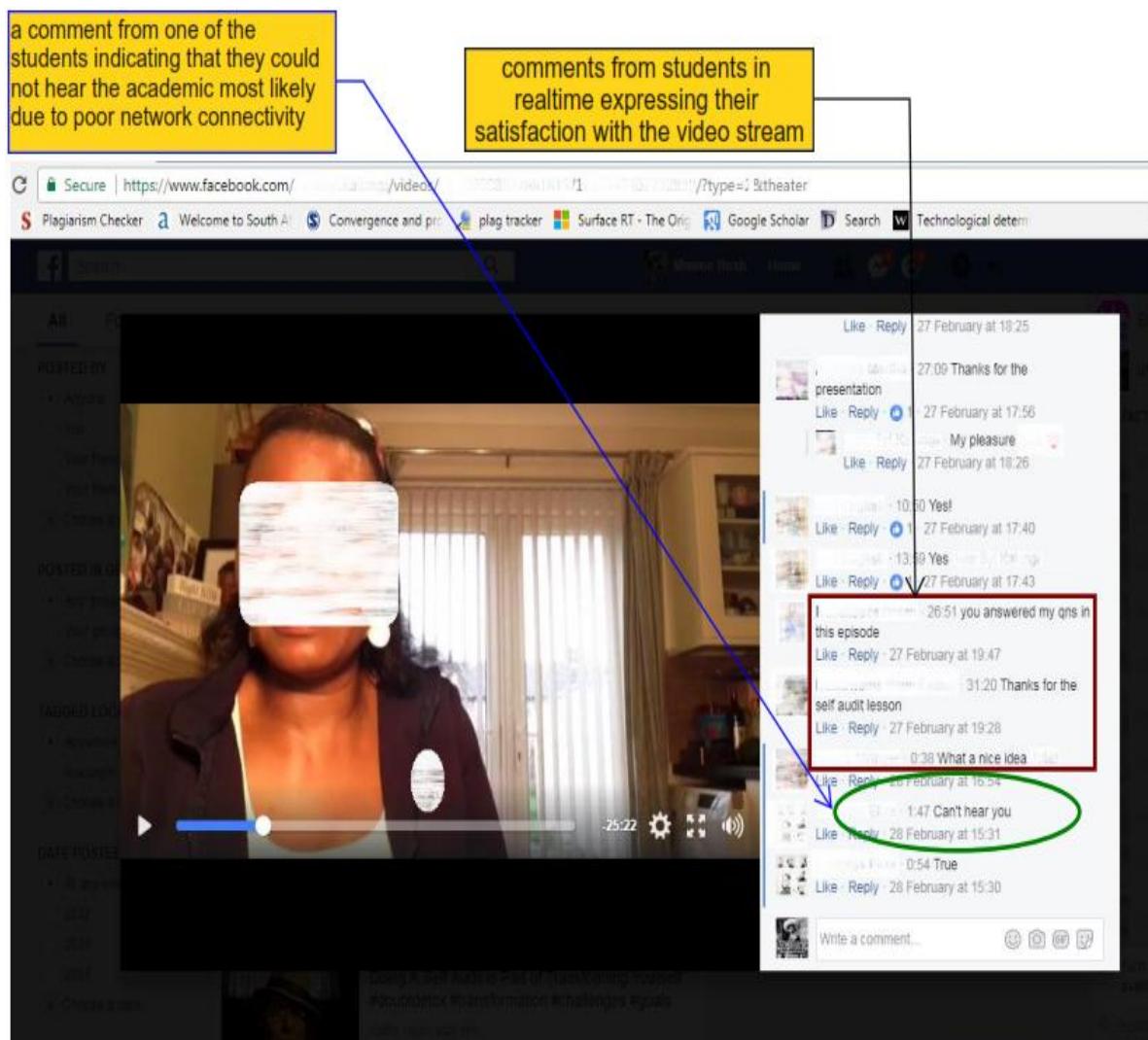


Figure 4.9: Screenshot from Mukyala's Facebook Live session with a student commenting about his inability to hear her broadcast

Just like Mukyala, Loketo indicated that many times, the Facebook live broadcasts were affected by poor internet connectivity and the students' frustration could be seen in the comments section during the streaming of the presentation. The majority of the students, however, persisted till the end and this may be attributed to the hype that was associated with the use of this kind of technology for teaching and learning. Loketo voiced his concerns about the poor connectivity that both the lecturer and students had to endure:

You see the kind of environment we operate in is still lacking in terms of facilities. The campus internet connection is basic and many times unavailable. I have to rely on my personal modem [data] subscription, otherwise I cannot get anything going. I think the students also have to buy data bundles on their smart phones to watch the streaming video ... although it is also problematic, at least it is better than the connection offered by the university. It is a sacrifice that they are sometimes willing to make (Interview transcript - Loketo).

These lecturers indicated that Facebook live offered a new avenue to interact with their students and they were willing to try it out. However, they had reservations regarding its value, especially for postgraduate learners. They felt that the postgraduate adult learners despised the technology and preferred to have their sessions in the traditional face-to-face setting (physical classroom). Mukyala indicated that when she suggested to her postgraduate class that they have a live discussion session via Facebook, she was rudely informed by one of the students that they were not “dot com” students.

Although the majority of the academics in this investigation felt that the social media feature of synchronous streaming was bound to alter the way in which academics interact with and present course material to their students. However, not all of them were eager to use social media features such as Facebook live because many felt that it was quite demanding in terms of resources as it required a stable internet connection. Some also felt that it disadvantaged the students who did not own smart phones or have access to an internet connection on their computers. This is evidenced by Makyati’s resistance to this new mode of teaching:

I have heard of that Facebook Live thing, people go online and broadcast whatever they feel like. I see it many times with my friends in the social circles. Personally, I have not tried it, I have not really thought about using it as an academic for teaching. I believe that many of my students have not even heard about it since they don't even own smart phones. Maybe I will explore it in the future but for now it is something very new and quite expensive. The students would need internet bundles [Internet connectivity]. Who would foot that connection bill? (Informal conversation - Makyati).

Certainly, some of the academics were indeed tapping into the potential benefits that social media offers in education. The academics felt that the nature of social media could provoke more thoughtful responses from the students. Based on the perception that their online delivery and comments were being viewed and read by both students and other academics, they were cautious in what they said and paid more attention to how they wrote and how they spoke in their online submissions.

The academics in this investigation felt that there was no need to convince students of the value of social media since many of them were already using it and it was much easier to interact with them in the online world where many spent most of their time.

The data gleaned from this study indicates that the academics were appreciative of Facebook's ability to connect them with their students. The experiences shared by these participants were enlightening. To them, Facebook supplemented the available LMS since they could use it to deliver course material and at the same time engage in discussions with the learners. The fact that it was free and that its set up was not complex motivated the students as well as academics to adopt it as an interaction medium. They seemed to prefer this mode of synchronous transmission because they got feedback from the students instantaneously. Although they (academics) did not like people who were not students joining their online classroom conversations, they appreciated the convenience that was associated with this tool since they could engage their learners anytime, anywhere as long as they had internet connectivity.

4.2.3.2 Social Media: Blogs

As a means of sharing experiences, resources, and knowledge among professionals in different fields of specialisation, many of the academics had adopted collaborative technologies. Blogging/web discussion forums are popular new forms of internet usage. Blogs are defined as a hosted service that allows the user to create and broadcast content, share resources, engage collaboratively with communities of interest and typically communicate effectively to a potentially global audience (Wheeler, 2010). Academics worldwide are gradually harnessing the potential of this ‘architecture of participation’ to support the increased engagement of learners within a diverse collaborative online context. Academics use their personal/class blogs to create running comments on their teaching process, and sometimes to communicate their ideas to colleagues. They can also ask questions, test ideas and post comments on other people's blogs. Due to the asynchronous nature of the posting and comments, blogs are an ideal tool to promote thoughtful forms of learning. Notably, blogs are well-known as personal tools that look like diaries, but in online format, and made available to others to read.

- **Blogs as collaborative spaces**

“I enjoy blogging and have learned a lot. It’s a kind of friendly way to provide feedback... knowledge is built through collaborative processes.”

Some of the academics reported the use of blogs in this study. In particular, four participants in this study cited the use of blogs as supportive platforms that they could employ when undertaking contemplative tasks or studies that may advantage students or colleagues in cases that called for sharing their work. In this regard, blogs offer collaborative spaces, which were preferred by many of the academics in instances where students in their classes needed to jointly work on particular assignments.

The academics also noted that technologies like blogs were significant in enabling an environment where academics collaborated among themselves within departments, faculties and the university at large. These academics pointed out that these collaborations had spread beyond the university to include linkages with other institutions of higher learning. It was evident that technology was used to share human resources, such as academic expertise, between universities.

Magufuli, an entrepreneurship academic detailed how he used blogs to enhance collaborative activities between himself and the students. He explained that the blogs would allow students to upload the results of their assignments, create changes or do peer review work without the frustration of emailing the work back and forth through email in order to create the final product. Blogs ensured seamless communication between the different parties, and was less intricate in comparison to the traditional ways associated with project collaboration. This is evident from his utterance:

I enjoy blogging and have learned a lot. It's a kind of friendly way to provide feedback because you can always check on the progress of the assignments as students exchange ideas or upload results of their class projects. You can always provide guidance in case you notice that the conversations are going off course ... I like them You know... knowledge is built through collaborative processes (Informal conversation - Magufuli).

The statements of this academic depict his preference for blogs as a way of knowledge construction through feedback and idea exchanges with students in his classes. His preference for blogs is indicative of the benefits that he derived from using them in his practice, which enabled him to learn from the collaborations that took place.

Twatoba also found that blogs offer a unique opportunity for collaboration. He indicated that blogs were a convenient way to keep in touch with like-minded researchers in his field of practice. He encouraged students in his postgraduate class to explore his and other lecturers'

blogs as he believed that they could find inspiration for projects or stories by simply looking through blogs and sites like WordPress™. Although Twatoba did not use blogs in his teaching, he utilised blogs as a research space where he could collaborate with other researchers.

Aaaaah! I use blogs for collaborative research. I am always in touch with my international partners on a number of research projects, in Australia, US, New Zealand and many others so we always share a lot of information (Interview Transcript - Twatoba).

Loketo, a computing lecturer with significant experience in the use of ICT, also found that social media such as blogs offers a unique opportunity for collaboration. He found that the blog provides students with a collaborative environment where both peers and the lecturer can interact with each other. However, he noted that it is a time consuming and expensive practice and that the relationship between the lecturer and student can be disorientating. He explained his point of view as follows:

Am cautious when I use social media like blogs or Facebook, I am not the “tough/strict” academic they know in the physical world, I adopt an entirely social face. Students are usually not certain of how they should act online. Their intention is learning and the social aspect is usually not their concern. There other channels [like LMS] that are absolutely professional that they could use for communication but these seem to be less friendly and so they have no clear how to do it or what to do (Informal conversation - Loketo).

This academic voiced his concerns about the need to create an environment that is conducive for students to interact with the lecturer without the constraints of a formal classroom or LMS context. His statement points to a general feeling among students that the physical classroom is too formal and sometimes restrictive of student expression, which may be different when blogs are used.

- **Blogs as a form of reflective practice**

“It kind of helps me to... revisit it or even make clarifications depending on their comments.”

From the interviews I had with the participants, I discovered that some of them were appreciative of blogs as platforms that provided them and the students with an opportunity to apply various aspects of teaching and learning through knowledge sharing, reflecting on knowledge as well as experiences. Although there were indications that the academics had obtained positive results from the use of blogs, it seemed that they had not fully exploited the

potential of such tools as many simply used them for feedback purposes. Wakukyalo spoke of the helpfulness of blogs; she indicated that students equally found blogs very useful, especially during discussions on weekly topics. Such platforms also offered the academics better flexibility in the nature of the tasks available in their teachings. Blogs' usefulness is evidenced in the excerpt below of Wakukyalo's utterance.

Blogs have been helpful in my catering classes as they have allowed me to give feedback on some of the class assignments, for example, when they are working on recipes, I can give them feedback pretty fast ... I use blogs as teaching tools to reinforce theory it is an easier way to learn recipes from other people ... (Interview transcript - Wakukyalo).

These statements allude to blogs providing an opportunity for this lecturer to reflect and analyse course material that was made available on her blog. She noted that the fact that blogs can be commented on provides an opportunity to give feedback to her students, thereby scaffolding the student in his or her pursuit for knowledge construction.

Another lecturer indicated that blogs were important in gauging her students' understanding of the subject area. Mukyala pointed out that blogs were crucial in promoting self-directed learning and reflection, aspects that are important for university students who need to manage and take responsibility for their own learning.

It kind of helps me to collect more information to ascertain whether they [students] understood or did not understand a particular topic and [I] revisit it or even make clarifications depending on their comments [feedback] (Interview transcript - Mukyala).

Mukyala indicated that from time to time, she would post questions on her blog to provoke students into critically thinking about the issues they had covered in their face-to-face sessions. This was meant to reinforce learning and allow students to reflect on their knowledge and link application to practice. She also noted that on other occasions, she would use the blog to pass on information to the class as evidenced in the screenshot below (see Figure 4.10).



The screenshot shows a university website interface with a blue header bar containing links for Web Mail, Website, Electronic Resources, Timetable, Tutorials, and Privacy Policy. Below the header is a navigation bar with icons for E-Learning Platform, Home, Site blogs, and Blog entries. The main content area is titled "Site blog" and features a post titled "THE INVENTION OF THE WORLD WIDE WEB CHANGED THE WORLD" by [REDACTED] on Friday, 5 February 2016, 4:59 PM. The post content discusses how the invention of the world wide web has transformed sectors like banking, insurances, education, etc. It includes a link to an HTML file. Below this is another post titled "MUBSep now online" by [REDACTED] on Thursday, 25 July 2013, 8:40 PM. This post welcomes colleagues to the [REDACTED] e-learning platform and mentions enhancing teaching and learning at MUBS. It also includes a link to an HTML file. Two arrows point from boxes above the screenshot to specific parts of the blog posts: a black arrow points to the first post with the text "Blogs used to re-enforce learning.", and a red arrow points to the second post with the text "Blogs used to disseminate information to both academics and students".

Blogs used to re-enforce learning.

Blogs used to disseminate information to both academics and students

Web Mail | Website | Electronic Resources | Timetable | Tutorials | Privacy Policy

E-LEARNING PLATFORM

Call Us: +256 [REDACTED] Email: learning@[REDACTED]

Home > [REDACTED] > Site blogs > Blog entries

Navigation Site blog Add a new entry

Permalink: [REDACTED] Comments (0)

[REDACTED] "THE INVENTION OF THE WORLD WIDE WEB CHANGED THE WORLD" by [REDACTED] - Friday, 5 February 2016, 4:59 PM

Anyone on this site [REDACTED].html.pdf

The invention of the world wide web has transformed many sectors such as banking, insurances, education, among others. What do you think?

Associated Course: ECWD0123 [REDACTED]
Permalink:
[REDACTED] Modified: Friday, 5 February 2016, 4:59 PM
Comments (0)

MUBSep now online by [REDACTED] - Thursday, 25 July 2013, 8:40 PM

Anyone on this site [REDACTED].html.pdf

Hello Colleagues, here is the [REDACTED] e-learning platform. Enjoy the usage as we enhance teaching and learning at MUBS

Permalink:
Comments (4)

Mobile App

Figure 4.10: Blogs as tools for communication and collaboration (screenshot of Mukyala's blog page)

One of the academics interviewed did not see the need to start using blogging tools in his teaching practice. Musomesa indicated that although he had heard about blogging tools, he had not explored their use in his teaching and learning. His statement affirmed his views on blog use:

No, I don't use them I have not used them yet but I have heard people say that it's another tool that you can use [for teaching and learning] (Interview transcript - Musomesa).

This lecturer's views could be attributed to some form of technophobia, or fear of being embarrassed in class when the technology failed. This may be partly due to a lack of technical skills or exposure to technologies such as blogs, which made it difficult for him to integrate it

into his practice. This is not uncommon as many academics struggle with this perception of new technologies.

These academics felt that the classroom environment was too restrictive, especially for their students. They believed that by making use of blogs, students would open up to new ideas and would also be in a position to contribute to the on-going discussions outside the confines of the classroom walls. By retracing the conversation, the academics and students would be able to reflect on their deliberations and scaffold learning. The blogs in this study were deemed significant for academics because these enabled the participating academics to stay in touch with like-minded people. This was important for research collaborations and knowledge sharing. Blogs seemed to allow academics to foster debates and carry out brainstorming on important topics. However, not all of the academics in this study were comfortable with the use of blogs. Their reluctance to adopt these in their pedagogical practice may indicate that they did not believe that it would significantly improve their pedagogical practice.

4.1.3.4 Freeware messenger apps as communication tools: WhatsApp™

“It has actually made communication to the group very easy”

Two of the academics in this study indicated that they made use of WhatsApp™ in their teaching and learning practice. WhatsApp Messenger has been described as “a cross-platform instant messaging application that allows most smartphone users to exchange text, image, video and audio messages for free”(Church & de Oliveira, 2013, p. 1). Loketo, one of the younger academics in the Faculty of Computing and Management Science, preferred to use this form of social media. He believed that this media was more user-friendly and more convenient since the majority of the students in his class had smart phones and were using this form of communication for social purposes. He talked about instances where it was convenient for him to use WhatsApp™ as an effective form of communication. He described his approach:

Sometimes when you want to communicate to the whole class at once you can communicate to the course leader through social media, the groups [students] have a WhatsApp account - as a class it has actually made communication to the group very easy ... So I do use WhatsApp (Interview transcript - Loketo).

Makyati also indicated that he used WhatsApp as a means of communicating with students in his human resource management class. It must be noted that although WhatsApp Messenger offers the opportunity for text, audio, image and video communication, most academics

resorted to only using text messaging. Makyati indicated that the students in this group were also using the WhatsApp group to exchange information that related to other courses, as evidenced by some of the screenshots of the group chats that he shared with me (Figure 4.11 and Figure 4.12).

The screenshots (Figure 4.11) below are from a WhatsApp group (DHRM EVE 2016-17) with over 256 students that was formed by Makyati for the human resource management class. Students joined the group by requesting the class president or the lecturer [Makyati], both of whom were administrators on the group, to enrol them on the group. Thereafter, they would be in a position to receive and post information to the group, as illustrated in the screenshot below. The lecturer moderated the discussions on the group together with the class president.

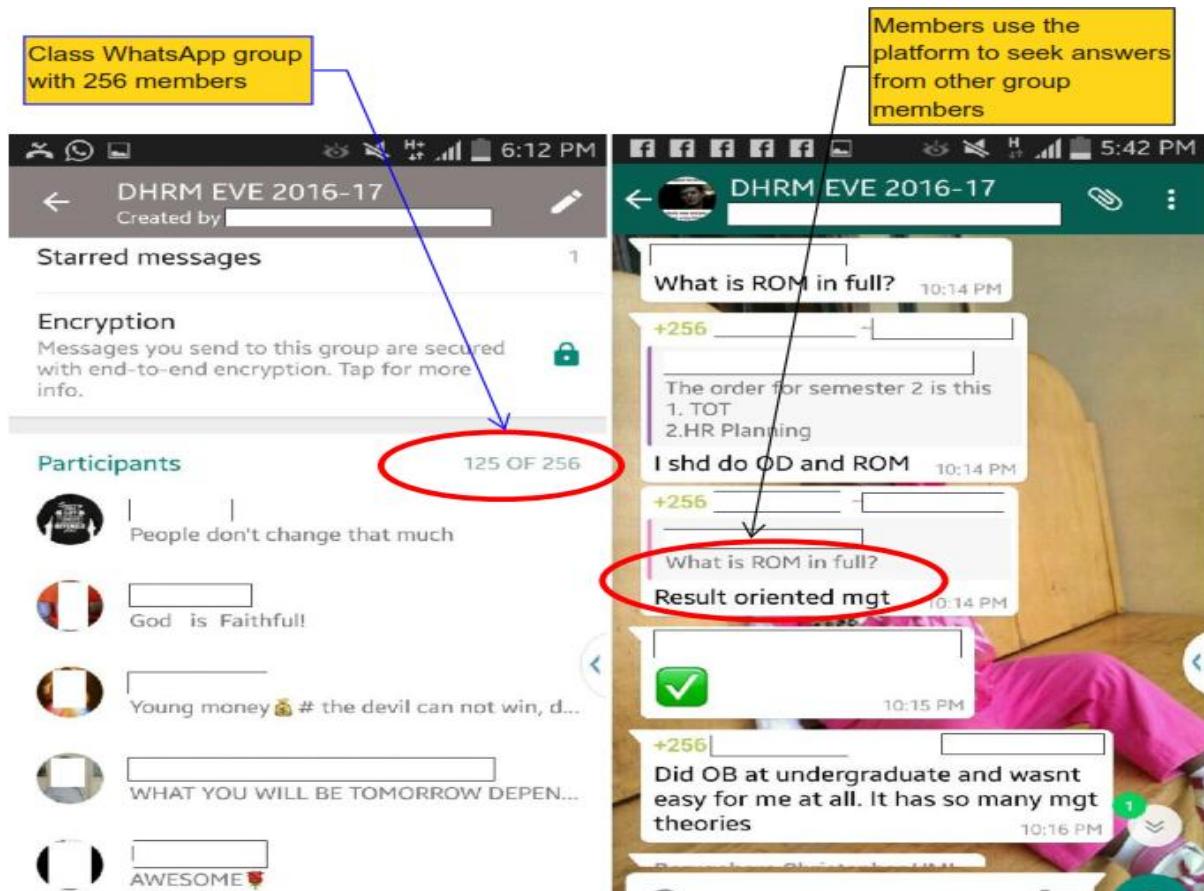


Figure 4.11: WhatsApp group created by Makyati for the purposes of communicating with his students, and for communication amongst students

The screenshot in Figure 4.12 (below) relates to a discussion that the students had on the DHRM EVE 2016-17 WhatsApp group. It refers to a take-home assignment that was given by the lecturer in the human resource planning course. Students used the group to seek clarification



on the nature of the assignment and to ascertain whether it was to be done individually or in student groups.

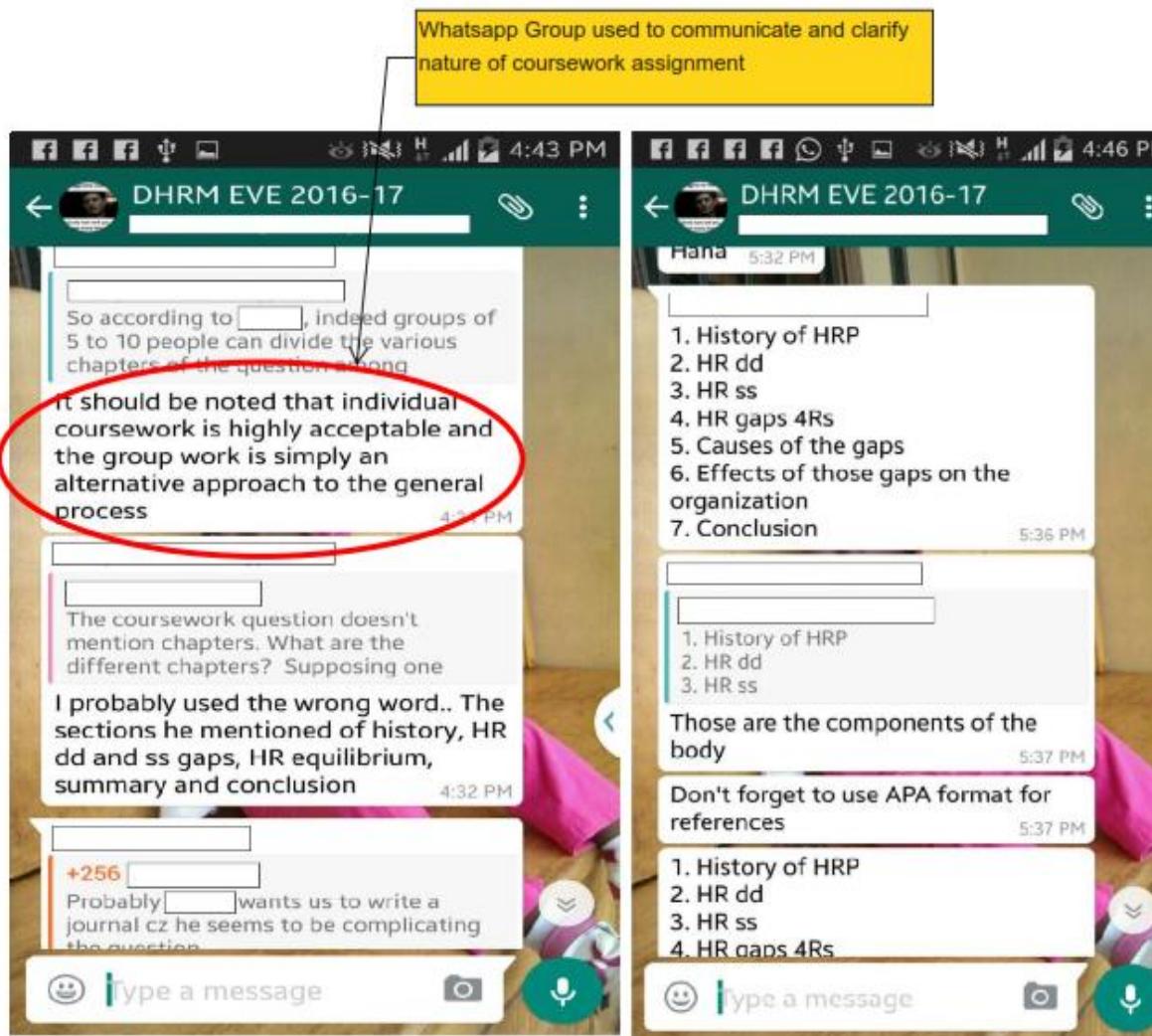


Figure 4.12: Screenshot of the WhatsApp group conversation addressing some of the issues that were not clear in relation to the take-home coursework

Wakukyalo's comment indicated that social media technology has the potential to keep academics abreast of the most current information in their disciplines. She stated that she used social media because she wanted to stay "on point" as evidenced in her statement:

Because of the trends in tourism I want to stay on point so I feel the only way to do that is to use technology such as social media, the WhatsApp Messenger. That is what is trending so that is what motivates me I guess "to stay the trend" (Interview excerpt - Wakukyalo).

Social media such as WhatsApp fostered dialogue among the academics and their students, and more so for students when they collaborated on course assignments. There was a general feeling among the academics that social media allowed the learners to engage in constructive debates other than using it entirely for social issues. They also agreed that WhatsApp was playing an important role in enhancing communication and the delivery of course material for their classes.

4.3 ICT paradigm shift: Changes in teaching practice

In this theme, I report on the influence of ICT on the educational purpose of these academics' teaching. Academics should know that they are not only content experts, but that their role requires new approaches to teaching and learning that provide authentic, experiential and stimulating experiences that exploit different technologies in order to meet the diverse learning needs of the 21st century learner. Academics must therefore prepare to be facilitators that are capable of supporting students in the learning and discovery process if they are to remain relevant in the 21st century. This theme illustrates how academics use digital technologies to reconfigure authority and control in the classroom. The research participants narrated their experiences as academics at a university and their diverse perspectives in terms of ICT usage. This theme provides a foundation for interpretation as it places the academic within the teaching and learning context. This theme comprises three categories, which are the evolving pedagogical role of the academics in the face of ICT integration, the academics' perceptions of how ICT use influences learners' attitudes, and how the academics believed ICT catered to multiple learning styles. The academics were requested to comment on their changing roles and responses to this approach.

4.3.1 The evolving pedagogical role versus the curriculum delivery strategy

“Well if you have well prepared PowerPoint slides, you completely forget about reading slides, you explain something while the students are seeing it ... it gives students time to reflect on something so I think it changes a lot.”

Table 4.5: Inclusion and exclusion criteria for the evolving pedagogical role vs curriculum delivery strategy

Inclusion criteria	Exclusion criteria
In this theme, I considered how the academics embraced ICT as central to their practice; and reviewed the academics' original position on teaching and learning.	This theme does not include the use of traditional teaching approaches. It also does not consider academics that are unable or reluctant to revise, restructure, and reinvent in light of new technologies.

By allowing the research participants an opportunity to reflect on their experiences, they described how their teaching practice had evolved. The narratives of the participants focused on the changing role of the academic, as the majority seemed to believe that the integration of ICT into their teaching practice contributed significantly to this change. The majority of the academics that I interviewed conducted lecturer-centred classroom arrangements. However, with the integration of ICT, many of their classes adopted a student-centred approach to teaching and learning. Notably, this was not always the case as the class sizes seemed to determine which teaching approach the academics would use. Student-centred approaches were most effective when the teacher-to-student ratio was manageable to enable the academics to guide the students, often on a one-to-one basis. The academics felt that the students sometimes developed new ways of thinking and learning based on their interactions with the students after and during these sessions when the approach used for instruction was student-centred. However, many of the academics expressed a concern that most of their classes had large numbers of students and this sometimes made it practically impossible to have constructive engagement with the whole class. Loketo's comments reflect a fear among academics that the large student numbers may not favour effective teaching and learning using technology.

We have large numbers of students, very large numbers, some of these technologies [Microsoft PowerPoint] may not be effective given the numbers. (Interview transcript -Loketo).

This academic expressed concern about the size of the classes (student numbers). He seemed to be of the opinion that a change in pedagogy was possible only when other factors, such as student numbers and time allocated for the class, were carefully considered. With small classes, this lecturer undertook a student-centred approach but resorted to the lecturer-centred approach when his classes had a large numbers of students.

Musomesa articulated that ICT was creating new ways or approaches in which the academics could engage learners. As a consequence, the role and thus the classroom practices of these academics were moving towards a more student engaging approach that allowed students to be part of the knowledge creation process. Musomesa explained how his curriculum delivery strategy had changed after beginning to use ICT.

Previously, before using ICT, I would imagine I have to go to class with a permanent marker or white board marker or flip chart, but now with ICT, I can incorporate those in the slides and I don't have to use all those unless I must, in this case the teaching aids all change, even the way I deliver, for example, even before ICT, sometimes you could be pushed into reading notes which is not a good thing especially when I had first started teaching. Well if you have well-prepared PowerPoint slides, you completely forget about reading slides, you explain something while the students are seeing it (Interview transcript - Musomesa).

The sentiments expressed by the majority of the academics in this study seemed to suggest the idea of moving away from the traditional classroom practice of dictating notes to a more interactive and student-centred approach to learning. Makyati, a human resource management lecturer, also described how his approach to teaching had changed as a result of using technology.

Ahhhhh! my method of teaching has changed, now I use more of presentations, rather than making the class teacher-centred, it is more of student-centred, whereby the student and lecturer participate, so the learning is more of participative other than a one man show. (Interview transcript - Makyati).

In Figure 4.13, Makyati (denoted as lecturer) takes on the role of a learner and moderator as one of his students makes a presentation to the class using the available ICT tools, such as a projector and laptop. The students (denoted as the audience) were allowed to ask the presenter (denoted as student) questions in relation to the topic presented. Makyati believed that his role should be that of a facilitator in the classroom. He argued that it was not his role to explain to students how to accomplish their assignments, but believed that as lecturer, he should provide

learners with opportunities and resources to explore new ideas on their own. This lecturer argued that students should be allowed to try out things (presentation) on their own, and in this way discover better ways to accomplish some of the given assignments. By asking students to do presentations to their fellow classmates, he hoped that he would instil in them confidence, and improve the quality of the students' arguments.

Makyati believed that the students who did presentations gained confidence in expressing their ideas over time, and that this act ensured that they were prepared adequately for their presentations.

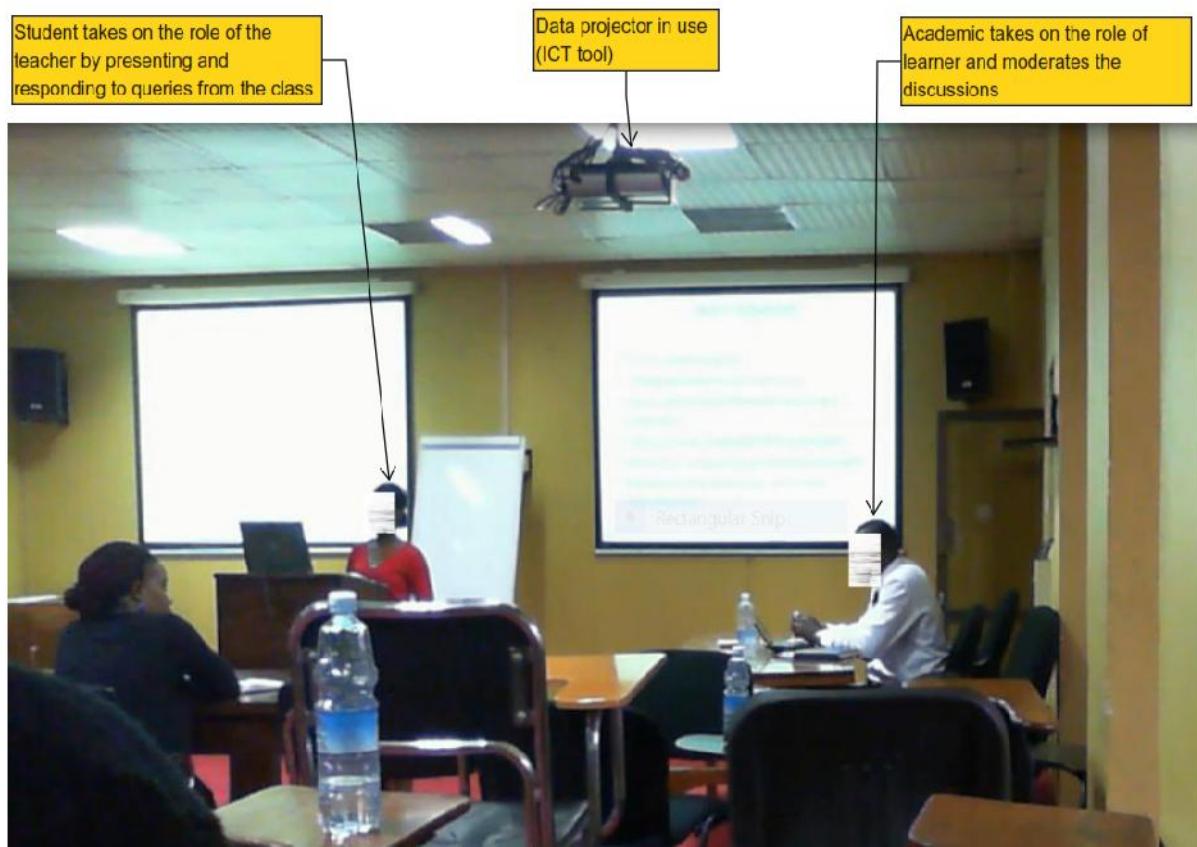


Figure 4.13: Academics evolving pedagogy - Makyati employing a student-centred learning approach using the available ICT tools

The majority of the participants felt that technology played an important role in the way in which they facilitated their course. For example, Loketo was no longer dictating notes as he had done when he first started teaching eight years previously. Loketo claimed that his teaching strategy had changed, as evidenced in his statement:

Yes, before it was too much of theory-based, reading from a book and students copying down. Now it's more of a discussion presentation format whereby I can be able to point out something

and have a debate about it as a group, it gives students time to reflect on something, so I think it changes a lot" (Interview transcript - Loketo).

The academics in this study that had attended a recently conducted seminar on the use of instructional technology believed that the use of ICT in their practice would allow students to be actively engaged in their courses, especially if a student-centred approach was adopted. However, Mukyala, although a strong advocate for student-centred learning, argued that this was not possible or ideal for classes with large numbers and that most of her undergraduate students were not optimistic about taking a leading role in discussions. She seemed to indicate that the undergraduate students were reluctant to “open up” and play a leading role in their class discussions by pretending to be ignorant about the topics being discussed. Contrary to this experience, she noted that in her post-graduate classes, it was quite different in that she guided and supported her students in her interactions with them. Mukyala noted that she learnt a lot from her post-graduate classes since they were student-centred, which allowed for the co-creation of knowledge. She explained it as follows:

The undergraduate classes have very many students. Lecturer-centred sessions are difficult to conduct, I sometimes try to make the classes interactive, but the student numbers are quite big and most times they shy away [un co-operative] or they think they don't know, but for the post-graduate classes, it is more student-centred, the student numbers are much smaller when compared to the other programmes. I usually try to introduce them to the course and then leave much of the learning to them. I actually learn a lot from them (students). I give them leads on what we are supposed to cover and then they go out and research, and some make presentations in class, we share the materials they came up with (Interview transcript -Mukyala).

Apart from indicating that his teaching strategy had changed from being lecturer-centred to student-centred when he integrated ICT, Magufuli also felt that the students had begun to actively be involved in carrying out research prior to making class presentations. This act of students taking charge of their own learning not only enriched their presentations, but also contributed to better informed class debates. Magufuli narrated how his teaching strategy had changed:

Yes, largely because it is now more interactive, there is more interaction and there is learning I used to use a lot of face-to-face [direct] lecture approaches with me being the centre of attention, but now with ICT, students can do guided presentations (Interview transcript - Magufuli).

Wakukyalo, one of the academics who taught the tourism course at this university, acknowledged that her role as a lecturer was changing with the integration of ICT into her practice. She noted that if students were given the opportunity to discuss certain topics in her course, they learnt better and felt empowered to learn. She described the transition in her teaching strategy as follows:

Well, before I used to try and give assignments before class so that students would make an attempt but then I realised they cannot discuss things they have never heard or seen. But now it is easier for me to show them these things using visual illustrations and then they discuss after because they have seen some of these things much as they can't experience them ... so this empowers them as learners (Interview transcript -Wakukyalo).

The classroom observations also exposed the traditionalism in the academics' opinions concerning educational practices, coupled with their apparent hesitancy to move away from their conservative educational practices, which were inclinations to strong teacher-centred learning approaches. The majority of the respondents in this study seemed to concur that some academics were unable to comprehend their changing pedagogical role, which is that the academic is now a guide to the student, supervising and directing students toward information and learning.

Some of the academics that were observed conducted their class sessions entirely as teacher-centred sessions (see Figure 4.14) without much use of the ICT tools that were available. They seemed to suggest that there was not enough time available for them to engage their students in lengthy discussions that were characteristic of student-centred sessions. Although the class size was small (about 20 post-graduate students), this particular academic was focused on covering the course material in the time available and adopted a lecturer-centred stance.

Although Twatoba believed that instruction should be student-centred, his face-to-face classes had not always been as student-centred as he would have desired them to be. He indicated that sometimes his teaching involved him taking centre stage in the classroom to have control over the class (to deal with "disruptive students"). In a class that I observed, Twatoba presented the course material using an already prepared Microsoft PowerPoint presentation for most of the session. He did not give much room for his students to discuss the presentation, apart from allowing for a few questions in the course of the presentation. When asked why he adopted this approach to teaching, he indicated that he wanted to cover content that the class had missed because of the many public holidays that interrupted their class schedule. Through reflective

practice, Twatoba realised that his teaching practice did not always reflect his beliefs to the desired extent. He related that he tried to reconcile his pedagogical practice and beliefs by allowing students to exercise more control over their learning. However, this was not observed in Twatoba's instruction when he conducted his sessions.



Figure 4.14: Teacher-centred learning approach; conservative educational practices - Twatoba facilitating one of his procurement classes

The majority of the academics in this study adopted a learner-centred approach to learning, especially when the class size was small. ICT was used to mediate learning and offered various ways of providing feedback. The academics felt that students had the opportunity to discover and enrich their discussions through the use of online resources. They (academics) believed that their role as facilitators was more bearable when ICT was used, and as such, were inclined to adopt learning approaches that empowered learners. These included students presenting assignments, take-home assignments, and involvement in discussions among other activities. The data also indicates that even where academics were not in a position to take on student-centred approaches, they still maintained the use of ICT as it was deemed to be easier to use to

deliver course content using technology as compared to the conventional approaches of teaching and learning.

4.3.2 ICT catering for various learning styles

“It promotes an environment that caters for sharing of knowledge, more of a learner centred environment.”

Table 4.6: Inclusion and exclusion criteria for various learning styles

Inclusion criteria	Exclusion criteria
Teaching tailored to learner needs, the manifestation of particular learning styles such as visual learners, kinaesthetic learners and auditory learners; slow learners; diversity in learning styles.	Ignoring individual differences between learners. Academics acknowledging all learners as equal in learning ability.

All of the academics in this study indicated that the various approaches of representing subject material offered by ICT supported student learning and reached learners with different learning styles. They seemed to suggest that having curriculum material in various multimedia forms (audio, visual, text and many others) could enhance learning across the different types of learners, rather than favouring the students who found fact absorption and rote learning easy. The majority of the academics believed that the traditional mode of teaching and learning in HEIs, characterised by the clichéd ‘one size fits all’ model, offered limited opportunities for today’s technology savvy learner.

The academics in this study argued that traditional schooling practices have offered limited learning pathways that do not suit the various learning styles. Musomesa, who had 18 years of teaching experience at this university, described how the integration of ICT in his teaching practice enabled him to be more responsive to individual students' learning needs, and offer more collaborative learning assignments. This created a more networked learning environment in which students could participate more constructively in terms of level and content. He believed that ICT caters to different learning styles, as shown in the excerpt below:

Well, I don't know much of the learning styles because am not an educationist but I believe, for example, if you have a student who learns by seeing, they will be able to learn faster. If you have those who learn by writing, they see the slides they will attempt to write. I think it does ...

it promotes an environment that caters for sharing of knowledge, more of a learner centred environment (Interview excerpt - Musomesa).

Loketo, who worked in the Department of Business Computing, argued that the integration of ICT into pedagogical practice enabled both learners and teachers to author and express concepts and ideas from numerous perspectives. Specifically, he stated that ICT provides students with several avenues to exhibit their knowledge and understanding that have not always been available or possible within traditional classrooms. He shared how he believed that ICT enables different forms of learning:

I think so.... In a bigger way, ICT accommodates both the quick and slow learners because it gives you a chance to really explain and illustrate more than you do in the traditional setting (Interview transcript - Loketo).

This academic pointed out that they were dealing with a generation of students that were technology savvy (millennials) as the greater majority used ICT, although many of their lecturers did not, or were still reluctant to adopt the technology. Loketo acknowledged that the majority of the academics were enthusiastic about the prospects that ICT would bring to their classroom practice and also believed that the integration of ICT in their practice would be significant in catering to the different types of learners.

Twatoba reported that in some instances, it was not easy to accommodate the different types of learning styles since the delivery methods were predetermined or planned before the class interactions.

In some cases also, it might not be easy because if you have chosen a particular method of delivery then that is the one you are going to use, if you have decided that you are going to use PowerPoint then that is the one you will use (Interview transcript - Twatoba).

This lecturer also indicated that he was motivated to use ICT in his teaching practice because technology allowed him to present course material in different forms. It provided an opportunity for him to interact with the different student groups at the same time.

Aaaaah! There are a number of factors that motivate me to do so, but some of the factors include, handling different groups of students at once, making student integrate different modes of presentation like Audio, visual, so that students can really catch up very fast and also trying to make it easy to communicate (Interview transcript -Twatoba).

Mukyala felt that ICT was helping her to accommodate a range of learning styles in many of her classes. She indicated that technology enabled her to present information in different formats for the different learners in her classes, especially in her tourism classes. She compared the situation today to that before the advent of ICT and concluded that the students were now best placed to learn since technology allowed them to view data in many forms.

Now that I use projectors, I try to use less of text words and more of illustrations because am able to show them [visual illustrations] more than before when I was using something printed where students could hardly see or follow what you are saying. But if you have an illustration they seem more excited watching from the projector than sitting with a piece of paper and a pen to learn something new (Interview excerpt -Mukyala).

From the interactions with the academics, it is quite clear that ICT gave them an opportunity to present course material to the different types of learners in numerous ways that would be appreciated by all. The academics recognised that students learn differently and that, as facilitators, they were duty-bound to adopt instructional approaches that would enable the different learners to make meaning of the course content.

4.3.3 Perceptions of changing student attitudes

“They become co-creators of knowledge. I have seen students develop their problem-solving skills when given learning tasks, you see them yearn to know more”

Table 4.7: Inclusion and exclusion criteria in terms of perceptions of changing student attitudes

Inclusion criteria	Exclusion criteria
Better learner attitudes; learner interest, learner motivation to learn, enhanced in the knowledge acquisition process; academic-learner interaction and feedback. Improved learner attendance and discipline, learners as active participants.	Learners as passive participants of knowledge academics motivating learners without the involvement of ICT.

The academics that I interviewed all acknowledged that the primary objective of ICT use in higher education was to create an environment where learners would acquire high-value education in a considerably shorter period of time. The majority of the participants mentioned the use of laptops and data projectors as their main tools for teaching and learning, although the internet was of equal importance, which they lauded as a form of technology that will

change the face of teaching and learning. In the interviews, they often talked about the fortés and flaws of the internet.

In my discussion with the academics, they voiced their approval of the fact that ICT can stimulate and boost students' involvement in the learning process. The use of multimedia was commended by the academics for adding fun to the learning process and ensuring that the students were fully engaged. The students exhibited curiosity and yearned to know more about particular areas when using ICT, which was absent in the traditional setting. Mukyala indicated that she had noticed changes in students' learning attitudes in the classroom when she planned her lessons using ICT. She described her students' increased interest when she used ICT (online affordance):

I think they are more interested; they are more interactive than when I was not using ICT. So it kind of lends a different sort of relationship you have with the students you are easier to approach online than physically, so in a way it impacts learning. I think they pick more interest in what you have to say (Interview transcript - Mukyala).

Twatoba's integration of ICT into his teaching seemed to make his subjects more appealing to his students and also increased their enthusiasm to learn. This academic also felt that the integration of ICT afforded students experiences that made their learning more real and relevant since the subject content seemed to come alive as learners were exposed to real-world examples through visual representations of what was being discussed. He indicated that the ubiquity of technology (ICT) promotes learning.

Yes, it has, because students now seem to be more interested in lectures, students seem to be more serious and time conscious and as long as they are on a computer and internet, they can access lectures from wherever they want. So they are really motivated, even if they are at home or away, they can attend lectures [online] (Interview transcript - Twatoba).

Loketo, narrated that he had experienced a remarkable change in the way the students interacted with him, as indicated in his statement:

Yes, it has [use of ICT,] there is more interaction between me and the students through the discussions that we have and they are able to read something off the projector [screen] and may ask a question about it. Which wouldn't be the same when you are dictating [reading out course material] (Interview transcript - Loketo).

The participants in this study also pointed out that with ICT, notably the internet, the students seemed to appreciate the multiplicity of views on a particular topic or theme, which was important in developing critical thinking among students and encouraging new ways of accessing knowledge and intellectual enquiry. All of the participants argued that ICT use in their practice enhanced learners' participation. Wakukyalo had this to say:

Yes, definitely they like those classes [computer mediated-classes] more than when we just have to sit and give hardcopy hand-outs and discuss ... yah. In terms of participating, they are more engaged and alert than before (Interview transcript - Wakukyalo).

The desire to integrate ICT in teaching was welcomed by Musomesa because he believed that in addition to making his classes more engaging, it freed the learners from writing down each and every sentence in his classes, making the students active learners.

Yes, I should say yes because previously without ICT, you just taught and read notes to students and you would see many of them concentrating to write with minimal interruption but when I use ICT in my classes and ask students to carry out learning tasks, they are very active. They become co-creators of knowledge. I have seen students develop their problem-solving skills when given learning tasks, you see them yearn to know more (interview transcript - Musomesa).

The academics in this study also believed that the use of ICT in their practice allowed students to acquaint themselves with technology as part of their preparation for life after graduation. They believed that technology helps students to interact better with the course content and to achieve stronger learning outcomes. The academics seemed to say that the students were appreciative of the time saved when they taught using technology. The academics were thus quick to adapt and add new materials to their classes, keeping content as current as possible and engaging students in course tasks in ways that appeared to make them more active, excited and involved. One of the academics offered the following view on changing student attitudes:

Definitely, their attitude has changed because most students now understand things faster, appreciate it has really changed, in the past it was difficult to explain things without demonstration and it also gives students a way for better participation. They participate for feedback. They do exams online; they also share information with their colleagues, so it has really changed (Interview transcript - Twatoba).

Similarly, Musomesa opined that integrating ICT into the teaching and learning process encouraged students to learn independently rather than depend on the academics. He indicated that he preferred to use ICT in his post-graduate classes rather than the undergraduate classes

since they [post-graduate students] were more likely to possess ICT tools such as smart phones and laptops. Nonetheless, Musomesa expressed concern that all was not rosy with ICT integration in the classroom. He seemed to say that ICT usage may lead to many students becoming inactive, requiring spoon-feeding and thus being less involved in critical thinking. He described his experience of how ICT influenced his learners:

Uhmmmm... not really, if the students do not intend to come for class still they will not come, even if you use ICT [in reference to undergraduate students], there is a tendency of simply downloading material from the internet by students even when they do not understand it. But my experience with the other e-learning platform is that the students, especially the mature students [graduate students] are comfortable because they know that even when they don't come, they will attend the class [online] but the others...No (interview Transcript -Musomesa).

This statement indicates that no matter what the academics did in as far as using ICT to enhance teaching and learning, some groups of students were not bothered to engage in learning. They did not believe that ICT use would make teaching and learning better, but instead believed that ICT would help them download whatever they needed for their assignments in the form of course material.

The data indicated that students were more engaged and motivated to learn when technology was integrated into the teaching and learning practices of academics. The academics observed that their students seemed to have an authentic purpose for learning that was not necessarily present when traditional teaching approaches were used. The academics further noted that with the integration of ICT in their pedagogical practice, students seemed to exhibit a heightened engagement when working with internet resources. ICT enabled students to access and engage with course material and apply higher-order skills (critical thinking). There was a general feeling among the academics that students' attitudes towards learning had changed when ICT was adopted, and they seemed to say that students did not find their sessions boring when these were punctuated with videos, animations and internet excursions. This seemed to erode the boredom that was associated with traditional teaching and learning practices and therefore encouraged the students to be more actively engaged in the learning process.

4.4 ICT as a catalyst for professional development

The participants revealed that through their experiences at the university, they had developed skills that facilitated the integration of ICT into their teaching practice. In this theme, I report on how the academics pursued the acquisition of different ICT skills. The research participants

narrated their personal abilities, their experiences as academics, and their diverse perspectives shaped by these experiences. The majority of the participants were in agreement regarding the importance of academics' ICT competency. They also believed that continuous training and development were crucial for the academic profession to improve not only pedagogical skills, but also practical skills. This theme highlights the various efforts to ensure that these academics remained relevant in light of the new skills required in their practice. This theme consists of three categories, namely: academics' self-appraisal of their ICT skills, learning ICT through self-study, and systemic training in which I relay and interpret their accounts of their personal and academic involvement in their quest to acquire ICT skills and knowledge for teaching and learning.

4.4.1 Academics' self-appraisal of their ICT skills

"I have the basic skills, I can type, use the internet, I know how to use Microsoft Excel, Word, even Outlook ... yah."

Table 4.8: Inclusion and exclusion criteria in terms of academics' self-appraisal of ICT skills

Inclusion criteria	Exclusion criteria
In this theme, I exclusively considered the ICT competencies of the academics, their pedagogic knowledge, and ICT capabilities.	I did not consider skills that were unrelated to the ICT competencies of the academics, ICT.

The interviews conducted with the academics revealed that most of them believed that they had the ICT skills that were required to execute their roles. The academics in this study indicated that they were comfortable using basic applications such as email and Microsoft Office application programs. These applications gave them the ability to create learning material that was well organised and also gave them the ability to share or communicate this information, for example, using email. These academics relied on their competencies and skill sets to integrate ICT into the teaching and learning process successfully. These academics made three important statements relating to the various competences in the use of ICT.

I think am good at databases, web designing. I think I can develop some small practical applications given time. Am good at the Microsoft packages (Word, PPT, Excel, Access), some of the other packages like Dreamweaver, Adobe and probably other small packages that deal with more editing and maybe pictures (Interview transcript - Loketo).

I have the basic skills, I can type, use the internet, I know how to use Microsoft Excel, Word, even Outlook ... yah. (Interview transcript - Wakukyalo).

I can type, edit word documents, I can make PowerPoint presentations, I can also use some equipment like laptop and I can also use LCD projectors, yah (Interview transcript - Makyati).

The academics' statements were an indication that they were confident to handle tasks that required ICT skills in their practice. The majority believed that they were equipped with adequate basic ICT skills that are necessary in the 21st century. For example, Twatoba felt that his ability to use the internet and email had made it very easy for him to remain in contact with not only the students, but his colleagues as well. He would use email to share information, especially with his students.

If you have their class emails it becomes easy, if you are sharing information on some particular topic, so there a number of factors as to why I use it but one of them is, it makes students understand things faster. It also helps one to disseminate and share information with students and colleagues alike very fast (Interview transcript - Twatoba).

The majority of the academics stated that they were proficient with spreadsheet programs such as Microsoft Excel as many used it to manage class records, for example, students' grades in different assignments and exams. They further claimed that they processed students' exams on their own using office application packages such as Microsoft Word for setting, typing, editing, and proofreading. Makyati had this to say:

I use programs like Excel to process results of students (Interview transcript - Makyati).

Magufuli, who confessed to having had many challenges with the use of ICT tools when he first started teaching about nine years ago, also had this to say.

I use Excel most in analysing student performance. Its powerful inbuilt functions make my work as a course administrator easy (Interview transcript - Magufulii).

Musomesa pointed out that he had become accustomed to the preparation of notes or assignments using Microsoft Word, which he would subsequently avail to his student in the form of hand-outs. He also added that this was common among academics. He stated that:

Actually, am comfortable with programmes like Microsoft Word when preparing class material and also for my research papers (Interview transcript - Musomesa).

Makyati began as a part-time lecturer at this university, and he felt that prior experience with computers in general was an important aspect in acquiring the necessary skills and knowledge to integrate ICT in his practice. He noted that the more exposure to technology the lecturer has, the more control he will gain over the new variables that new technology introduces in teaching practice. Makyati had this to say:

One experience, even before I started teaching, when I went to India I was taken to the laboratory and the teacher asked us to start the computers and I didn't know where to press. Over the years, I have had to practice with a colleague to show me some basics and then I can try out things on my own, I have learnt a lot through others. Am now quite comfortable with office applications (Interview transcript - Makyati).

This lecturer indicated that he had learnt a lot of basic ICT skills through others. His association with colleagues who were willing to help him find his way around the computer had played a significant role in enhancing his ICT competencies. He boasted that he was no longer the person that was ‘green’ [computer illiterate] in terms of computer usage.

The participants in this study echoed the need for academics to have basic ICT skills to be in a position to utilise modern instructional technology. Furthermore, it was expressed that academics must be familiar with different educational resources such as programs, online research journals and other internet educational resources.

4.4.2 Learning ICT through self-study.

“I like learning new things, especially now that technology usage is becoming a norm ... Actually, most of the skills I have are self-developed, I taught myself most of these skills with small tutoring.”

Table 4.9: Inclusion and exclusion criteria for learning ICT through self-study

Inclusion criteria	Exclusion criteria
Academics as lifelong learners; personal commitment and interest; academics' enthusiasm to learn and improve; academics as independent individuals; self-learners.	Academics as individuals who were comfortable with their ICT skills set.

The academics appeared to take initiatives to develop their ICT proficiency. Wakukyalo explained how belief in her own ability and competence enabled her to overcome some of the barriers to the integration of ICT in her classes. Although, she harboured the feeling that she was not adequately prepared for the challenges surrounding the integration of ICT. This academic narrated how the capabilities she developed through trial and error and during staff development programmes were a catalyst for her engagement with ICT in the classroom and provided the assurance necessary to continue using ICT despite the hurdles she encountered.

Yes, mostly my learning process has been more of trial and error, I like learning new things, especially now that technology usage is becoming a norm. The more I practice with different programs the more I get comfortable with them. Am definitely a hands-on type of lecturer. Of course, sometimes we have ICT workshops but they are simple awareness kind of sessions. The biggest tasks have been self-taught. It has been me ... luckily am a quick learner and when I say am going do it, nothing really stops me. So trial and error has worked for me (Interview transcript - Wakukyalo).

The academics seemed to be in agreement about the manner in which most of them had developed their ICT skills. Twatoba also indicated that the new ICT skills he possessed were generally achieved through personal learning. He believed that given enough time, he would be able to develop his ICT knowledge and skills and translate these into good practice in his classes.

The skills I have are basically the things I have learnt on my own, they are many especially to do with using technologies to make presentations for my lectures, basically I taught myself PowerPoint. Everything to do with connecting projectors, that was something that I discovered by myself. There was no lecture that I attended for that, I learnt it on my own, so it is a self-acquired skill in ICT (Interview transcript - Twatoba).

Loketo exhibited a positive attitude towards ICT and indicated that he enjoyed learning about new technologies that would enhance his pedagogical practice. He recognised the need to devote more time away from his lecturing schedule to learn new applications. Loketo felt that this was the only way in which he would develop confidence with the technologies that he was unfamiliar with given that his specialisation was in technology-related subjects. He thus stated:

Actually, most of the skills I have are self-developed, I taught myself most of these skills with small tutoring. This involved reading software tutorials and CBT [Computer-Based Training] nuggets that I came across over the internet (Interview transcript - Loketo).

Academics such as Musomesa seemed to demonstrate an enthusiasm to learn and develop their ICT proficiency by themselves. This academic reported that he set aside time to learn new computer applications that he felt were important in his practice. Musomesa was quick to point out that it was this initiative that enabled him to learn some of the skills he possessed at the time of this study, as evidenced in his statement:

Yes, for example, I taught myself SPSS (Statistical Package for Social Scientists) through practice. I did not go anywhere to learn it; neither did I learn it in class ... I learnt by myself ... Yah (Interview transcript - Musomesa).

Makyati also indicated that he usually made time available away from his routine work to improve on his ICT skills by taking leave to learn some of the applications that he deemed important to his practice.

Yes, I have tried at least to improve my skills; I have tried to learn more. I usually go on leave and try to teach myself how to use certain tools like Microsoft word. Many times I read the inbuilt tutorials and then try out on my own (Interview transcript -Makyati).

The academics seemed to suggest that it was not very hard for them to acquire new ICT skills, provided that they were willing to go the extra mile. They also seemed to suggest that acquiring these competencies was self-paced and, as such, they did not find it tedious since they were in a position to act on it whenever it was convenient for them, which ensured that there was no interference with their class schedules.

The majority of the academics expressed their desire to learn more practical skills regarding the pedagogical uses of ICT if they were to ably integrate ICT into their practices. They seemed to concur that for them to effectively make use of technology in their pedagogy, the environment must be conducive to enable them to familiarise themselves with technology and its potential uses. This would involve self-initiated training programmes that were relevant and current to the needs of the faculty.

4.4.3 Systemic training and support

“A trainer shows how it works and then we try ourselves.”

Table 4.10: Inclusion and exclusion criteria for systemic training and support

Inclusion criteria	Exclusion criteria
Academic's ICT professional and academic qualifications; University-based capacity building initiatives; Institutional based training and development programs	Academics self-initiatives to acquire ICT competencies

The data analysis revealed that for these academics to be in a position to implement technological tools, they needed to know how this technology works and how they could best incorporate it in their practice. The academics considered periodic training and support as essential to optimise the adoption of technology tools to benefit students in the university. The participants reported that the university would, at times, organise short course training workshops for Microsoft Office programs such as Word, Excel, PowerPoint and the newly introduced Learning Management System (LMS). This they perceived as an opportunity to polish up on some of the skills that they possessed already and be introduced to the latest software and developed applications, which they could employ in teaching instruction and also to find ways to blend these new skills into their teaching practice.

The academics reported that the university was actively engaged in organising training workshops that were meant to equip them with the necessary ICT skills. The university administration had interest in enhancing the skills of the academics and improving the academics' competency and professionalism. Training courses relating to ICT usage were held at the university whenever there was a need. Magufuli mentioned that the university had organised numerous ICT training sessions and workshops for its staff to enhance teaching and learning. This academic had attended many of the training sessions, although some were not directly related to his area of specialisation. Magufuli stated that the training sessions enabled him to acquire skills to communicate better with his students using technology and also to improve on his classroom computer mediated delivery approaches. He noted that the training sessions benefited him in many ways.

Yes, mainly to enhance teaching but another one was on learning how to use those programs to improve communication (Interview transcript - Magufuli).

Certain participants reflected extensively on issues surrounding ICT skills acquisition. Loketo mentioned that the training sessions he attended were largely aimed at imparting basic ICT skills for the most commonly used Microsoft Office applications, for example, making presentations using software programs like PowerPoint or how to create documents using Microsoft Word, or even how to use the e-learning platform. He added that these training sessions were important because they were also used to change the mind-sets of the academics as far as using ICT in their practice was concerned. He noted that this greatly improved their presentation abilities and interactions with the students.

Yes, we were training in the basic use of IT programs and packages like Microsoft Word, Excel, PowerPoint, and MS Access. These trainings have helped many of us work with technology tools confidently (Interview Transcript - Loketo).

Musomesa highlighted the university's effort to ensure that the academics were equipped with ICT skills through periodic training and, more recently, training on the use of the LMS.

The university has put up a number of trainings to encourage staff to use ICT to teach and how to use the e-learning platform (Interview transcript - Musomesa).

Even though the majority of the academics were appreciative of the ICT training workshops that were arranged by the university, they had reservations regarding the bad timing and execution of the training. Many of them noted that they took place at a time when they had scheduled lectures. Wakukyalo, from the faculty of Leisure and Hospitality, echoed this concern.

The times are not convenient for me personally, but sometimes they are there [training sessions], like recently they wanted us to learn how the e-learning platform works ... sometimes they have these classes for ICT training but I cannot make it so I miss out (Interview transcript - Wakukyalo).

This sentiment was reiterated by other participants such as Makyati, who made reference to having had no prior formal ICT training “...*I did not receive any prior training in ICT usage before I started teaching*” (*Interview transcript - Makyati*). He however noted that occasionally, the university conducted short course training on the usage of ICT but many of these were not well planned. Makyati elaborated that:

...most of them are not well planned, sometimes they are scheduled during a time when we are busy with other university activities and we end up missing the trainings (Interview transcript - Makyati).

The majority of the academics in this study expressed positive attitudes towards the training programs organised by the university. The academics welcomed the practical nature of the training and that during the training, the trainers usually demonstrated how to use some of the ICT features, and afterwards they were given an opportunity to try them out on their own. This meant that the academics were provided with an opportunity to not only gain theoretical understanding but also to acquire practical skills. Makyati shared his experience:

Typically, there are some instructions. A trainer demonstrates how it works or how it is done. And then we try out ourselves. And very often, I already start to think about how I could use this application or this method in my own classes. So, I start to plan it into practice (Informal conversation - Makyati).

As noted, the interviewees considered academics' professional development essential to the effective integration of ICT in their teaching practice. The need for periodic training and development arises from the changing role of academics, academics' attitudes, and at times, sub-standard pedagogical and ICT skills. The general perception of the academics' responses was that accessing information and programs to deliver a curriculum is a critical skill for academics in the digital age, and that academics must be fully familiar with instructional technology and its peripheral equipment, software, and the internet.

4.5 Perceived challenges in ICT

Although this research focused on the use of ICT in the teaching practice of these academics, it is necessary to consider that the participants operated in resource-constrained macro, meso and micro environments (Uganda being a developing country with limited resources) that made it very challenging for the academics to explore the potential benefits that accrue from the use of ICT tools in their practice without mentioning the challenges involved. This theme explores the inhibiting factors that the academics had to deal with in attempting to integrate ICT into their teaching practice. The data analysis revealed some common challenges that were faced by the academics in their teaching practice. The academics voiced a number of challenges that they faced daily in their teaching practice that may have discouraged them or reduced their willingness to integrate technology into teaching. The participants voiced that there were largely meso (University level) barriers, whereas others were micro (classroom) level barriers. This theme was synthesised into a number of categories, namely: inadequate ICT access, infrastructure and technical support services; a lack of commitment to ICT and administrator support; the cost of technology; professional development; and ICT policy and plans.

4.5.1 Lack of access to ICT for teaching and Learning

“We don’t have special rooms that we can use, you have to find a way to make the classroom you are in work.”

Table 4.11: Inclusion and exclusion criteria in terms of a lack of access to ICT for teaching and learning

Inclusion criteria	Exclusion criteria
Absence or inadequacy of ICT resources for teaching and learning.	Learning with ICT.

In integrating ICT into their teaching practice, the issue of technology inadequacy emerged from almost all of the interviewees. The academics felt that the lack of computers was one of the major challenges that greatly inhibited the integration of ICT into their teaching practice. In elaborating, Mukyala explained how the limited resources in the computer labs were supposed to be used for two distinct purposes:

The student to computer ratio is very poor ... a ratio of 1 computer for every 4 students, something like that and then the labs are mostly for teaching purposes and yet that is the same facility that students are supposed to use to access the Learning platforms [LMS] so in many cases when they go to the [computer] labs, they find them occupied and they can't use them (Interview transcript - Mukyala).

Just like Mukyala, most of the academics noted that the classrooms were overcrowded, which compromised the quality of teaching. Magufuli noted that the university had tried to solve this problem by separating the large classes into different small and manageable groups of students for class purposes, but this had not resolved the problem, in fact, it exacerbated it by creating more academic and administrative work.

The students in Mukyala’s class found it difficult to follow the presentation because of the class size both in terms of student numbers and physical space. The presentation projection at the front of the class was hardly visible to the students who sat at the back of the class (see Figure 4.15). Although this academic had hoped that by using ICT tools such as the data projector she would be in a position to deliver course material better, she was constrained by the size of the class.



Figure 4.15: The challenges of overcrowded classrooms - Mukyala facilitating a Master's programme class

In one of the classes that I observed for one of the ICT-related courses, a number of students did not have the opportunity to use a computer during the scheduled practical session and some had to participate as onlookers as the others worked away at the computers. Loketo confirmed that the large student numbers were a challenge not only for the lab sessions but also in his theory classes and that they were not able to access some facilities like computers.

The large number of students in my classes makes it hard for me to have a one on one with the students that are having learning difficulties. It is even worse with the practical ICT classes in the computer labs because you find students standing and watching others simply because the computers are fewer than the number of students in my class (Informal conversation - Loketo).

The academics were equally concerned about the absence of enough data projectors and the physical layout of the classrooms, which were historically not designed for the use of ICT. Makyati stated that:

The [classroom] environment does not support the usage of ICT, ICT requires you to work on other facilities that can enable you to use the equipment in a better way but you find that sometimes, the equipment is not enough and this hinders its use (Interview transcript - Makyati).

In explaining the challenge in the classrooms, Wakukyalo argued that the lecture rooms were not suited for ICT use. She further explained that many of them lacked electrical power sockets in the right places and the necessary wiring or networking to allow the usage of basic ICT tools like projectors or even laptops.

We don't have special rooms [rooms equipped with presentation gadgets like LCD, smart boards and Public-address systems] that we can use, you have to find a way to make the classroom you are in work (Interview transcript - Wakukyalo).

She stated that the challenges were not personal as such, but largely institutional challenges that many of her colleagues also faced in their practice.

Magufuli indicated that the university was still experiencing the problem of slow and intermittent internet connectivity, which that seemed to discourage the academics from making use of ICT. He was aware that the university was using old and many times outdated technologies that were characteristic of the analogue era that could not cope with the large number of users in both the student population as well as academic and administrative staff. He stated that:

Network connectivity is still poor, sometimes you want to use it [internet] but in many cases you are always let down by network failure and you lose interest" (Interview transcript - Magufuli).

Magufuli noted that by improving the network infrastructure, many academics would be motivated to integrate ICT into their practice. Similarly, Musomesa indicated that infrastructure was a big challenge. From his point of view though, even if he was prepared to use technology in his teaching, the environment was not enabling:

Yeah, the challenges are largely infrastructure because the ICT infrastructure is not adequate, for example, sometimes the internet is off and yet you want to have these online classes.

Sometimes you expect that students can access your lectures wherever they are but probably they can't access those lectures because they do not have a laptop, they do not have a computer, they do not have access to internet so it's largely due to infrastructure. While me, as a person, I may have a positive attitude and I have prepared, infrastructure is the biggest hindrance ... yeah (Interview transcription - Musomesa).

Mukyala discussed her eagerness to make use of ICT in her course planning and execution, yet she felt let down by the failure to access network resources both at the university and at home. The same academic expressed her frustrations, stating that one could only try for a given number of times before eventually giving up and finding alternative means. Her displeasure was expressed as follows:

Sometimes you want to upload material on the learner management system and network is so slow and then you keep trying for the day and you give up on it (Interview transcript - Mukyala).

The challenge of poor bandwidth or network connectivity was exacerbated by the high costs that were associated with internet connectivity for both academics and students. The majority of the respondents were not comfortable with the high charges associated with internet access, especially if they needed to access the internet off campus. In such cases, they could only do this using a modem from one of the telecom service providers like MTN, where the charges were quite high. Circumstances sometimes required that they accessed the internet only during off-peak hours, a practice that is known as 'moonlighting'. Twatoba seemed to echo the concern held by the majority of the academics by saying that:

Charges for internet in Uganda are very high and bandwidth is very low it can't sustain internet connectivity sometimes (Interview transcript - Twatoba).

He observed that these high internet access fees sometimes tended to discourage academics from using technology for teaching. He explained that the transition to ICT mediated teaching and learning was not as easy as they had anticipated:

No, it has not been easy, because I come from a developing country (Uganda), internet connection is a very big issue, if it is on, its erratic, it is on and off, we lack gadgets [ICT tools]; we lack computers, even in the university itself the internet is not stable (Interview transcript - Twatoba).

The academics indicated that access to ICT, such as computers, both at the university and at home was problematic. The majority relied on their personal laptops and private connections

through internet modems to be able to interact with their students, who were worse off in terms of access. The high internet connection charges also contributed to the non-use of ICT by both academics and students. Poor connectivity, explained by the low band width, was reported as a turn-off for many academics who would have desired to use ICT in their pedagogical practice. The large class numbers exacerbated the problem as some students were not in a position to access computers to either download course material or work on assignments that had been uploaded on the LMS.

4.5.2 Lack of infrastructure and technical support.

“So you have to find other means to deliver.”

Table 4.12: Inclusion or exclusion criteria in terms of a lack of infrastructure and technical support

Inclusion criteria	Exclusion criteria
Absence of the necessary ICT infrastructure for teaching and learning.	Available networks and technical support.

The academics had varying beliefs and perceptions regarding infrastructure and technical support services. They reported that they were sometimes dealing with obsolete technologies that did not add much to their practice. Loketo observed that “...*some of the technologies we have are obsolete, so the issues of technology failure are rampant*” (*Interview transcript - Loketo*). The academics stated that there was a lack of regular maintenance and updating of the existing ICT infrastructure and software on the part of the university management. Similarly, the academics indicated that there were very few data projectors at the university given the number of classes that were taking place. This was made worse by the fact that even of those that were available, many were faulty. The malfunctioning of the hardware in the classrooms was the most irksome issue for Twatoba. He referred to numerous times when carefully prepared lecture material was difficult to display or just would not work in a particular classroom because of faulty equipment. Twatoba stated:

*...even the projectors which are there are faulty. The other day I attempted to use three projectors which were all found to be faulty” (*Interview transcript - Twatoba*).*

The academics reported that they had to book the ICT equipment beforehand and then carry the tools they needed for teaching, such as LCD projectors to their classrooms. In one of the classrooms I observed, the academic had to delay the start of the class so that a projector could

be brought in from the shops. A lack of access to equipment such as data projectors was therefore viewed as an inhibitor to the integration of ICT into the teaching practices of these academics.

The academics also indicated that most of the classrooms had poor lighting control for computerised presentations. Most of the classrooms were not fitted with the technology, and more so projection capabilities, so the academics needed extensive support from technicians to even make a simple presentation possible. One academic member had this to say when asked about the challenges faced in using technology in teaching.

I don't face much.... It's not personal. It's more like the institution's problem or the country's problem. One, usually the sound; you use a project but there is no sound output so usually the things you want to teach they have to see pictures and then you have to explain. You know....!
(Interview transcript - Wakukyalo).

The academics believed that computer failures caused interruptions and the lack of technical support implied that the regular repair of ICT equipment could not be carried out, which in turn frustrated academic efforts to integrate ICT into their teaching. Makyati argued that:

ICT support influences academics to integrate ICT in teaching without wasting time trouble shooting hardware and software failures (Interview transcript - Makyati).

The academics mentioned technical issues as a barrier for academics and students alike when it came to using the LMS. The academics reported that the LMS was unreliable and required a lot of time to use given that they were still in the process of learning how to use it. This was worsened by the unreliable power supply. A disheartened Wakukyalo expressed her concerns as follows:

Sometimes you experience problems with electricity as it is in many sub-Saharan countries, at times power cuts interrupt teaching using prepared materials. Sometimes you prepare for your class and as you walk in the electricity goes off ... hahaha [laughs] so you have to find other means to deliver (Interview transcript - Wakukyalo).

Calling for technical support whenever the technology failed to work created delays and frustration and created a negative classroom experience for both the academics and students. Classroom support at the university was not available on the spot, and so they either had to wait for a technician or go without the technology that they had planned to use. As such, this discouraged Wakukyalo from using these technologies for teaching. The problem of power

outages is a chronic problem in Uganda; it has been a problem for many years and it does not seem to be going away anytime soon. This unreliability of power supply has made it challenging for academics to use ICT while teaching.

The academics reported the poor state of ICT equipment and how the university generally failed to maintain its hardware and software. They were concerned that most of the tools were not classroom ready. They also mentioned faulty projectors, equipment malfunctioning and power failure, among other problems. The lack of availability of some ICT resources was advanced by the academics as one of the major inhibitors in the use of ICT for teaching and learning purposes.

4.5.3 Resistance to change: the lack of positive attitudes towards the use of ICT

“But to me, I think it’s an issue of attitude.”

Table 4.13: Inclusion and exclusion criteria in terms of resistance to change

Inclusion criteria	Exclusion criteria
Lack of enthusiasm to adopt ICT. Traditional teaching approaches. Academics are unable to integrate ICT into the curriculum.	Willingness to integrate ICT into their practice; ICT curriculum-integrated content.

The data findings suggest that the majority of the academics believed that they had to change their attitudes towards ICT usage if they were to benefit from the affordances of technology in their practice. Magufuli believed that extra effort should be put in for lecturers who had been in the world of academia for over a decade but were reluctant to use ICT in the delivery of the curriculum. Magufuli was of the view that these academics were not yet convinced of the benefits of integrating ICT into their teaching process.

So we need to work on the attitude and the perception, most people have the laptops, there is internet, the students are willing, someone leaves the laptop and prints hard copies and goes to teach, but I think it’s about changing the attitude, encouraging them, telling them [other academics] the benefits to themselves but also in the learning process (Interview transcript - Magufuli).

Musomesa also reported that even when administrators at the university had made an effort to avail academics of ICT equipment, and some laboratories were well-equipped, there were

many academics who still did not make the transition to computer use. Their attitude towards ICT usage seemed to be unfavourable. They were not eager to integrate ICT tools into their teaching process and seemed unable to comprehend how this ICT would benefit their practice. According to this participant, there was a need to educate academics on the benefits that they would derive from the use of ICT, as explained in the statement below.

I know of a colleague, especially those that teach qualitative courses, they have always said that some of these courses cannot be taught using ICT, but to me, I think it's an issue of attitude. So first of all, it is to correct their attitude and appreciate and embrace ICT. The academics should be in position to know that ICT is a powerful tool in teaching and learning (Interview transcript – Musomesa).

In reflecting on whether there was need to change the mind-sets of academics, Makyati agreed that mind-sets needed to be changed such that academics become aware that they cannot do without ICT and that it has to be an integral part of their teaching and learning practice.

Yah, definitely, it's an attitude challenge, I think. Ahhhh, that mindset has to be changed such that you are aware that you cannot do without ICT and that it has to be part and parcel of what you do, once people get that then definitely it won't be hard (Interview transcript - Makyati).

The majority of the participants were of the opinion that academics need to view ICT more positively than they do now. One of the more notable points raised in the interviews in relation to academics' attitude towards ICT was that the academics' age and gender was believed to influence ICT integration in teaching practice. Mukyala expressed her views in this regard:

These attitudes are kind of hinged to the gender and age of a person, the younger staff are usually faster to adopt some of these platforms than the older staff and also somehow the male are faster to adopt so the attitude also matters a lot (Interview transcript - Mukyala).

From the findings, it is apparent that the academics with a negative attitude towards ICT use were those who made no effort to integrate ICT into their teaching and learning practice. The academics also indicated that male lecturers tended to be more positive towards ICT integration as compared to females. They also mentioned that academics who were advanced in age were not eager to integrate ICT into their practice, probably because of the negative attitude they held towards ICT, perceiving it to be different and complicated to use.

4.5.4 The lack of institutional ICT policy and supporting guidelines

***“There is no documented policy ...If policies are there, am unaware,
they have not shared them with us”***

Table 4.14: Inclusion and exclusion criteria in terms of a lack of institutional ICT policy and supporting guidelines

Inclusion criteria	Exclusion criteria
Systemic policy support (Ministry of education, university policy); university policy guidelines; official circulars; university culture.	Academics' administrative practices; Ministry's administrative processes.

The data from the analysis of the interviews revealed that most of the academics were unaware of any form of ICT or e-learning policy. The university did not have a written policy that could be used in the classroom to guide academic practice for the effective use of ICT at faculty level, student or even systems levels. The majority of the academics were not aware of any ICT policy guidelines with regard to teaching. Twatoba, who had taught the -procurement and logistics course at this university for the previous six years, stated that:

Am not aware about it [ICT policy/e-learning policy] (Interview transcript - Twatoba).

Even those academics who indicated in their interviews that they were aware of an ICT policy reported that despite the fact that many had been at this university for more than five years, they had not come across any formal documents related to ICT policy from the university or issued by the Ministry of Education.

If policies are there, am unaware, they have not shared them with us (Interview transcript - Loketo).

Similar statements were made by the majority of the participants. The majority of the interviewees believed that the university provided an enabling environment for the integration of ICT in the curriculum through the creation of a Digital Centre, ICT training workshops and through the installation of a number of wireless access points (internet WIFI hot spots), among other initiatives. The academics described the university as undergoing long-term processes of change that would eventually lead to an ICT-driven university. Along with these statements, there were also those who claimed that due to the changes that were taking place at the university, for example, the migration of student records to an online record management

system and the digitisation of library services, there was a need for the university to formulate an ICT policy on teaching and be more supportive towards ICT use in teaching. The following is an excerpt from Musomesa:

Yah, I think the University should come up with a deliberate policy on ICT incorporating ICT in teaching, Yes that's one way and like I said the University should be supportive. Move away from the traditional way of doing things to the ICT driven (Interview transcript - Musomesa).

Magufuli noted that the university lacked an ICT policy on teaching as a specifically documented policy. He indicated that it was important for the university to have a written policy since it was in the process of transitioning to being an ICT-driven university and that if documented, it would provide important guidelines for academics on ICT usage. He seemed to imply that the lack of a documented policy created two categories of academics: those who were quick to adopt the use of ICT, even in the absence of a guiding policy; and those who were reluctant to make use of ICT, maybe because they were not compelled to do so. He did, however, allude to the fact that efforts were being made to have a written policy put in place.

There is no documented policy because, like I have said, migration from the traditional teaching approaches to ICT-based teaching has had its own challenges, there are those that are fast and those that are slow. The policy is not yet there but there is effort towards having one (Interview transcript - Magufuli).

Musomesa, who was from the Faculty of Graduate Studies, opined that although there was no written policy at the university, staff were encouraged to make use of ICT in their teaching practice.

There is no policy yet but there is a deliberate policy to encourage staff to use ICT for example online learning (Interview transcript - Musomesa).

He made reference to rhetoric directives from the university's administrators in regard to making use of ICT in their teaching practice, but also mentioned having seen no formal documentation in relation to a written ICT policy.

The document reviews revealed that there was a draft policy on ICT called "Kusoma Draft ICT policy" (See Appendix H), which has been in the pipeline for some time. Apparently, management had hoped to circulate the policy in the near future to guide ICT usage at this institution.

The participants noted that the ICT integration process was complex and a number of issues that inhibited its integration were raised, which included access issues, where the interviewees focused on the inadequate ICT infrastructure, equipment, technical support, low internet bandwidth, and power problem issues, among others. They also voiced concern that the facilities that were already in place, such as the digital centre, lecture halls and the conference halls, were not well-equipped and set up to facilitate computer-mediated teaching and learning. They were of the opinion that if the university addressed many of these concerns, the integration of ICT would be swift and smooth.

4.6 Perceived opportunities in ICT

In this theme, I report on the perceived opportunities for ICT integration in the pedagogical practice of the academics. Firstly, it would seem that the majority of the academics (at least in this study) were optimistic about the benefits of integrating ICT into their practice. The study findings revealed that the available opportunities, if embraced, had the potential to increase ICT usage among academics and improve the quality and delivery of higher education. This theme comprises two categories: the beliefs and attitudes of those that have the will to change; and the ubiquity of ICT, in which I glean and interpret the statements made regarding opportunities for ICT integration by academics in this university. The academics were thus requested to comment on the perceived opportunities that ICT presented in their teaching practice.

4.6.1 The will to change: the beliefs and attitudes of ICT agents of change

“With a positive attitude it is easy to use them [ICT tools] so generally the academics have to change their attitude toward the use of ICT in class”

Table 4.15: Inclusion and exclusion criteria in terms of the will to change

Inclusion criteria	Exclusion criteria
<p>Academics as an intrinsic part of the change process and a major component of all successful ICT implementation programmes;</p> <p>Academics as an essential component of ICT-curriculum delivery; facilitators and mediators of learning; blended learning; human and social actors; academics embracing their role as professionals;</p> <p>Academics having faith in the transformative potential of technology; academics promoting computer-mediated teaching and learning; Academics exercising agency.</p>	<p>Institutional and policy influences, social-cultural influences.</p>

The majority of the academics in this investigation exhibited positive attitudes towards integrating ICT into their pedagogical practice. This was viewed by these lecturers as an opportunity that would make the integration of ICT into the teaching and learning at this university much easier. According to these agents of change, the use of ICT was bound to make their courses more exciting, enjoyable and it would greatly improve course material delivery. The participants seemed to believe that in the future, ICT in educational institutions would be central to every aspect of institutional life and in the professional development of academics. According to them, ICT will further alter the way in which teaching and learning takes place in the classroom. One academic reflected on the necessity of ICT in the future of education:

I think it is necessary [ICT] because that's where the world is headed; we see mutual learning on the increase because the volume of information is increasing. If you don't use ICT, you may not know what is happening in your discipline in terms of research, it is cheaper to subscribe for e-resources than hard copies, so, it is cheaper, one in updating, and you get real time

updates. Even in proposing changes, it is easy to communicate your opinions (Interview Transcript - Magufuli).

Magufuli, one of the enthusiastic ICT users, noted that having a positive attitude towards ICT usage is essential, especially when the adoption of ICT in teaching practice is concerned. According to Magufuli, having a positive attitude towards ICT usage facilitates the learning of new innovations [technology]. Moreover, having a firm belief in ICT allows for a more rapid transition in adopting new instructional technologies such that lecturers are eventually in a position to use this ICT knowledge in their teaching practice.

Yes, because when you don't look at it [ICT] positively, it is very difficult, but when the attitude is positive, you embrace it, but also the adaptation becomes faster ... With a positive attitude it is easy to use them [ICT tools]. So, generally, the academics have to change their attitude toward the use of ICT in class. So those are opportunities but also the rate of innovation is very high (Interview Transcript - Magufuli).

Wakukyalo noted that having a positive attitude towards ICT usage had helped her to integrate ICT into her teaching practice. She felt that ICT presented opportunities that academics could take hold of only if they believed in them and then tried these out with different tools. She noted that despite the affordances of ICT in teaching and learning, many of her colleagues were finding it hard to work with technology because of the poor attitude they held towards ICT. Wakukyalo mentioned that the advent of mobile technology was changing the way in which both academics and students communicated, and was helping both academics and students to do things more efficiently.

First of all, they need to have the love for it [ICT], some people use it because they have to and if they don't really have the love, they will not try to get better, you know, for instance, now in ICT we have smart phones, they are making ICT of course different, one can access information, send information and may other things. But if someone does not have the passion to learn how smart phones work, it will probably not be useful because now like the apps help us do things in a better way (Interview Transcript - Wakukyalo).

Another common response from the academics was regarding the opportunity for ICT to provide real-life, practical examples of the academic concepts applied in the teaching and learning context. The majority of the academics felt that ICT can enhance teaching and learning when academics make use of visual examples of the tasks that they are engaged in. Loketo

mentioned that ICT presents an opportunity to visualise material and communicate with students in many different ways.

Ahhh... Because sometimes it makes it easier to show what you need to tell students by projecting it to them. Videos bring ideas to life and it is easy, it is less tiresome than dictating a whole pamphlet of notes than projecting these slides to students (Interview Transcript - Loketo).

In addition, Loketo mentioned that the use of visual aids makes curriculum material clear and easily understandable. Loketo indicated that learning got better when illustrations were used and it was possible for classrooms with greater student numbers to follow the PowerPoint presentation since it was more captivating than merely talking.

Now, if you are going to have a lecture of a big class of over 100 students, I think employing a projector and PowerPoint slides makes it easier to be able to reach everyone and it's easier to explain and give a visual account of whatever you are doing (Interview Transcript - Loketo).

ICT usage provided affordances for the academics to acquaint students with the real world within the classroom context. They showed and let students see what real life activities are like. For this purpose, the academics used a variety of authentic material, including up-to-date and topical information. For instance, this included watching videos, visiting the websites of authentic learning material, as well as listening to different news from the internet. Wakukyalo was appreciative of the potential effect of ICT to enhance the learning environment through the visualisation of concepts that were perceived as difficult to learn using the traditional way, especially by her students in the leisure and hospitality courses. She argued that one of the main advantages of using ICT is that students have an opportunity to see the material for themselves.

Yeah ... of course, like I said, a picture is worth a thousand words. If someone can see what you are trying to tell them, they get it much faster and they don't forget the picture, even in the exams they try to visualize it, like this is what he said about it ... yah. (Interview Transcript - Wakukyalo).

Just like majority of the academics in this study, Musomesa noted that ICT gave him the ability to cover course content within the short time allocated, in addition to enriching his classes with visual material. When asked whether ICT integration in his pedagogy was of any significance, Musomesa had this to say:

Yes, it does, in terms of being able to cover what I have to cover within a limited period of time and also in terms of showing students what I want to show them visually (Interview Transcript - Musomesa).

The academics also highlighted that the usage of ICT would increase students' motivation, for example, through better communication with the academics and among the students themselves. This would also enable prompt feedback from the academics, which would in turn enhance the students' achievements. Mukyala mentioned that a more traditional conception associated with ICT is that it focuses the students' attention and increases interest in the course matter being presented.

I think just looking at the soft side of the class room, I think they are more interesting, they are more interactive than when I was not using ICT. So it kind of lends a different form of relationship you [academic] have with the students. You are easier to approach online than physically, so in a way, it impacts learning. I think they pick more interest in what you have to say (Interview transcript - Mukyala).

Many of the respondents believed that integrating technology not only helped them to increase their own efficiency, but it also helped them to become better academicians.

ICT plays a very important role most, especially in developing your research skills, because research is a very important area in academics and it also helps you to efficiently execute your duties as a lecturer (Interview transcript - Makyati).

While the bulk of the responses seemed to suggest that the academics were enthusiastic and positive about technology, it was evident that some of the respondents were doubtful of the changes that come with technology, and seemed to imply that these changes were negative. In addition to voicing concerns about training and support and the cost of technology, some of the respondents did not believe that the benefits were significant enough to justify the huge investments of time and resources in technology. From these discussions, it became evident that it was the younger academics that believed in the use of technology for teaching. The following comment reflect the concerns regarding some of the older academic staff:

Yah, those incidents are there especially if you have the old staff who are not familiar with computers. That generation that has been in the practice before. There is fear for the computer and there is that resistance of thinking that they cannot move on to the new era of ICT so there could be some instances when gadgets are available but people fear change and it's an old

generation they are not compatible and they are not comfortable with using ICT. (Interview transcript - Twatoba)

The respondents in this study seemed to desire some form of motivation to integrate ICT into their teaching practice. Whilst the majority of the academics held positive beliefs about the integration of technology in their teaching and learning, some academics were not convinced that technology was instrumental in their practice. A few were sceptical as to whether computer-assisted techniques actually are any better than the conventional approach to which they were accustomed.

4.6.1.1 Enhancing 21st century skills.

“I really need ICT because there is no way I can share my findings without ICT, its only ICT which can provide the platform.”

Table 4.16: Inclusion and exclusion criteria in terms of enhancing 21st century skills

Inclusion criteria	Exclusion criteria
This theme exclusively considered that ICT made it possible for academics to be experts in communication; ability to facilitate dialogue and improvise answers; and managing chaotic conversations.	I did not consider perennial skills.

The majority of the respondents described the ability of both students and academics alike to communicate with others all over the world as an important motivator. The academics confessed that ICT gave them and their students the opportunity to access communities with similar interests without geographic constraints. Additionally, ICT facilitated collaboration and group learning. It was evident that increasingly, these academics had begun using ICT to create and deliver study material. As a result, learning had become increasingly collaborative and active for themselves and their students. One of the academics indicated that ICT offered him the opportunity for research collaboration, and to regularly share information with colleagues. Twatoba stated that:

ICT is a platform which makes life easy. It makes dissemination and sharing of information easy. It makes us access research material like journals, it makes us collaborate with people in distant places, which would be completely difficult without IT. So one of the reasons that prompted me to use ICT was to share and even disseminate information with colleagues across

the globe and also to share my research with other people and get feedback for improvement (Interview transcript - Twatoba).

The academics in this study also reported how there were increased opportunities, using tools such as the internet and e-mail, to encourage collaboration amongst learners and to accommodate a flexible learning environment, thus making it possible for students to learn at their own pace. Magufuli acknowledged that the majority of the academics were enthusiastic about the prospects that ICT would bring to their classroom practice and also believed that the integration of ICT into their practice would go a long way in catering to the different types of learners. He indicated that ICT provides realistic options:

Technology allows us to present our teaching material in many formats - Audio, video or text. This means that the students are able to see information and derive meaning from different angles. We have those that are good at reading and understanding but again there is this category that will pick better when they watch a video. I think it gives us options that are more realistic as far as helping different learners (Interview excerpt -Magufuli).

The academics in this study also noted that ICT was significant in enabling an environment where academics collaborated with one another within departments, faculties and the university at large. The academics pointed out that these collaborations had spread beyond the university to include communication with other institutions of higher learning. It was evident that technology was used to share resources, such as academic expertise, between universities. In one of the faculties, Musomesa explained how they collaborated with another university:

In terms of making use of ICT, our major collaboration has been with the ICT University in Cameroon, which has a big branch in the US because we have our staff enrolled on their programmes and we also have staff teaching on their programmes and because it has students in many parts of the world the students are taught online. I think this has been the major collaboration opportunity (Interview transcript - Musomesa).

The desire to collaborate with other institutions was evident, and ICT provided a platform that made these ventures possible. In some cases, this was expressed in partnerships where the academics received capacity and support in the form of training or professional development programmes. One of the academics explained why their partnership with other institutions was symbolic.

We partner with other institutions like ICT – University (USA) to train our staff, like the Cisco Training Academy the telecom service providers and others. There is that commitment because

we have the basic necessary ICT infrastructure and it is on budget (Interview transcript - Magufuli).

The academics at this university indicated that they facilitated different course units as a team of two or more people. They highlighted that ICT provided an opportunity for them to share and synchronise their course material and to learn from each other, as well as to deal with student queries. They seemed to say that without ICT, their material was fragmented and sometimes not well coordinated for student consumption. Loketo, one of the academics that participated in team teaching, explained as follows:

ICT provides members [academics] an opportunity where they can share/upload notes on behalf of the team. Secondly, we all have access to the same topics we teach on the e-learning platform where students enrol and we work together sometimes to answer student queries and handle online courses (Interview transcript - Loketo).

Mukyala added to this debate by indicating that academics and students could communicate with each other directly using this platform, as evidenced in her statement:

Yes, the way it is structured all team members are given accounts in each course for which they are facilitators. So you can communicate directly with team members or with students (Interview transcript - Mukyala).

The academics emphasised the importance of developing 21st century skills due to the emergency of sophisticated ICT. The further mentioned expanding capabilities to accomplish teaching and learning through collaboration with colleagues. The collaborations had moved from face-to-face meetings to increasingly computer-mediated interactions with peers and students on and off campus or in different parts of the world. They were able to improvise solutions and facilitate dialogues in the unpredictable and chaotic flow of online and physical classroom discussions. These academics believed that they had grasped the art of communication, which is prerequisite for the 21st century.



4.6.2 The ubiquity of ICT

“I have a feeling that students should be able to attend class wherever they are and access my classes wherever I am.”

Table 4.17: Inclusion and exclusion criteria in terms of the ubiquity of ICT

Inclusion criteria	Exclusion criteria
The availability of internet connectivity on and off campus; ownership of smart phones; affordable internet connection charges.	Lack of ICT equipment.

The other opportunity reported in the findings related to the fact that the academics and students had access to some ICT infrastructure on campus and off campus to support technology-based teaching and learning. The study results indicate that the academics and students had access to ICT facilities such as computers, smart phone handsets, the internet, laptops at their offices; students' workplace; student hostels, the university library, internet cafes, and in their homes. Twatoba mentioned that the university was involved in expansion efforts in terms of setting up other branches upcountry, and that ICT was seen as a means to link these different sites. Twatoba noted that the use of educational technology had the potential to enable distance education as it would be easy to conduct online lectures from anywhere, as noted in his statement:

Yes, like the expansion of our university to setting up other branches is really a very big opportunity to integrate ICT in our teaching practice because we can use lecturers from here and even conduct same lectures and other people can access our lectures from here. It's just a matter of logging onto the computer at a specific time you can also administer your exams and mark them online. You can also give students feedback online, it makes life simpler and it saves a lot of time and associated costs (Interview transcript - Twatoba).

Academics like Mukyala believed that ICT played or would play a major role in ensuring that both the academics and the students did not miss their classes due to distance. Mukyala believed that it was important for academics to embrace the opportunities that technology presented in their practice so as to be more efficient facilitators.

When you think of instances where you can't be physically in class, when you are using technology, it doesn't mean that you won't teach, you can still find a way of reaching out to

them without being there physically. So it kind of changes the whole experience, you become more efficient in your teaching than someone who is not using it (Interview transcript - Mukyala).

Musomesa and Magufuli indicated that they were motivated to make use of ICT by the fact that ICT gave them the flexibility to conduct their lectures from wherever, without the restriction of time and space.

One of my personal objectives of using ICT is at a certain stage, I do not have to be in class all the time, I have a feeling that students should be able to attend class wherever they are and access my classes wherever I am (Interview transcript - Musomesa).

It is convenient and handy, like if you want to teach from home, you get students online, you teach. So one, you stay home you are relaxed, but two, it saves you the cost of travel. Three, that's the way to go, the only reasons we must use it is because it's the only reason, then sometimes it helps to use multiple sources of learning materials like if you are teaching online, you can search for some materials in real time (Magufuli).

The academics were optimistic that the developments in the telecommunications industry would go a long way in making connectivity a possibility in the university setting. They were hopeful that with time, the reduction in the cost of these technologies would make it affordable for both academics and students to use technology platforms as the medium of choice for instruction and learning. Magufuli indicated that ICT was bound to change the teaching landscape due to some of the useful software (such as skype, WhatsApp, Facebook) that could be used to address challenges such as a lack of effective communication or interaction between academics and students being freely available for download, as stated in the following excerpt:

One is that there is simplified telecommunication; the advent of the smart phone has simplified data access and they are cheaper these days. On average, a smart phone is 70 to 90 US Dollars, the bandwidth has also improved so it is easy to download materials, most of the programs are free downloads, so it is easy to use them (Interview transcript - Magufuli).

The academics also mentioned the availability of the internet as another opportunity for them to make use of ICT in their teaching practice. Mukyala expressed her views as follows:

Aaah, first of all, we have stable internet, which is at least fast enough so to the largest extent, I think it's the biggest facilitator. So you are able to look for information, you are able to share information faster and also at least we have the physical hardware to support this transition. Many students have laptops and then we have computer labs those without laptops can use and

then generally I think the university has played a role by trying to make sure the people use ICT. So with time, it will be a must for everyone to use some sort of ICT in teaching, so it also kind of helps you to start transitioning (Interview transcript - Mukyala).

Musomesa felt that the introduction of the Learning Management System was an opportunity for academics to deliver better content in their teaching and learning practices since it would make communication and the sharing of course material seamless.

The current opportunity available is the e-learning platform, the school has committed to invest in, I guess this is the biggest opportunity. If this e-learning platform is institutionalised, then teaching will be very easy, it's a big opportunity for me to use ICT. Then the other is the move by management to give laptop loans to staff, if you have a laptop dedicated to teaching then that also makes life easier to you (Interview transcript - Musomesa).

The academics believed that ICT usage in their teaching practice availed them the opportunity to improve on their efficiencies and speed, both from the perspective of lesson preparation and in terms of the efficiency of delivery of course material.

Of course, one, it is efficient, less paper work. It is easy to interact, like when am supervising students, it saves students the hassle, but it is also easy to archive the comments because they keep them in soft copy. Even when submitting publications for review, it helps them to track changes made in the document, but also the progress (Magufuli).

Generally, ICT improves on the way you teach and the way you deliver, it makes teaching more effective. What motivates me is that ICT makes my teaching easier and more effective, that's the biggest motivator really (Interview transcript - Musomesa).

Because I find it a better way of delivering my information easily and faster (Loketo).

The academics participating in this study felt that there were many opportunities for teaching and learning in the digital age. They indicated that academics' meaningful integration of ICT required both the commitment and the ICT skills to do so. The academics also believed that professional development in the form of training was also very important if they were to ably use educational technology.

4.7 Summary of the main findings

From the narratives of the study participants, there was a general endorsement of the use of ICT tools in academics' teaching practice (Category 4.1). The data obtained from the class observations and participant interviews revealed that the academics' use of ICT was very limited and simple in their teaching, as many of them used basic technology such as presentation tools like LCD projectors largely because they were easy to learn and use. The data collected indicated that an overwhelming majority of the academics approved of the use of social media for the communication of assessments (assignments) to the students and the delivery or presentation of the course content, as evidenced in their statements above. Most of the academics reported that the use of ICT not only simplified the delivery of difficult and complex topics in the curriculum, but that the students found it more beneficial when illustrations were used to depict real-life events. The use of LMS and Web 2.0 technologies was lauded by the academics as mediums that spread teaching and learning beyond the classroom walls.

Particularly, the interviewees recognised the significance of integrating ICT into their courses as having a profound effect on the academics themselves and the learners (Category 4.2). This was highlighted by their view of the evolving pedagogical roles of academics from being the focal point in the classroom to the role of being a facilitator and a guide (student-centred learning). The academics indicated that ICT enabled them to cater to the different types of learners by presenting course material in different formats and allowing learners to learn at their pace, anytime, anywhere. There was a firm belief that students were motivated to learn when ICT was used since they had the chance to work as independent learners.

Turning to professional development (Category 4.3), the academics were supportive of ongoing training and periodic development programmes. They agreed that the acquisition of ICT skills was crucial for the teaching practitioners to impart the appropriate knowledge and skills to students so that they are well-prepared to meet the challenges of the 21st century. However, the academics were critical of the uncoordinated and poorly scheduled training sessions that were organised by the university, especially those that took place when they had classroom sessions. It is also evident from the discussions with the academics in this study that not much emphasis was placed on the use of ICT in their teaching practice as many of them appeared to be left to acquire their own ICT skills and tools and determine how best to integrate ICT into their teaching practice. There was no clear policy on the promotion and use of ICT tools by academics at the university.

The data gleaned from this study seems to indicate that Kusoma University had made deliberate attempts to offer some basic hardware and software access for academics who wanted to adopt technology in their teaching. However, the university was still challenged by many other factors (Category 4.4). The academics in this study voiced numerous concerns in relation to hurdles that may have prevented them from integrating ICT into their practice. The narratives from the source data indicate that many of these seem to be related to inadequate/poor technology infrastructure, classrooms that were not adequately equipped with ICT tools, and a total lack of classroom ICT equipment, as well as insufficient time. Inadequate technical support for academics, both in creating and uploading teaching materials to online platforms, and in using them in the classroom was also mentioned. Many of the participants in this study seemed to concur that infrastructure-related hurdles, such as classrooms not being wired to accommodate computers, ill maintained ICT equipment, low-quality projection capabilities, as well as poor lighting made the academics' integration of technology difficult. The participants reported the reluctance of academics to embrace ICT, to attend scheduled training workshops, and the academics' inadequate ICT skills. The participants differed on the existence of ICT policies and guidelines with regard to the integration of technology at this university. Some of the participants were unsure of the existence of such policies; whilst others had heard of such policies but there were, in fact, no documented ICT policies. From the available documents that were analysed, and the interviews with the participants, it would seem that teaching using instructional technology had not progressed as envisaged.

Based on the study findings, there were numerous perceived opportunities that could be exploited by academics at this university in their pedagogical practice (Category 4.5). These opportunities ranged from the positive attitudes and beliefs that academics held regarding the integration of ICT, and the will to learn new skills and adapt to the changing pedagogical practice. Overall, the academics and students felt that the ubiquity of ICT made it possible both to continuously interact in and outside of the classroom, and that students benefited when ICT was at hand to help them access course outlines, course content, and assignments regardless of time and location. The uploading and online sharing of course content through social media and the LMS by lecturers and students promoted modern ways of interaction.

In the next chapter, an analysis and discussion of the findings of this study are presented.

CHAPTER 5

ANALYSIS AND DISCUSSION OF FINDINGS

5.1 Introduction

In this chapter, the main findings of this investigation, which were reported in the preceding chapter, are consolidated, analysed and discussed. Emerging patterns based on the experiences of the participants are highlighted. Consolidated findings regarding academics' use of ICT in their pedagogical practices, their beliefs and attitudes, professional development, perceived ICT opportunities and challenges are also discussed. Through this comparison, I will be able to locate my research findings in the field by drawing attention to whether the findings and results corroborate or challenge existing perspectives and, at the same time, validate my findings through extant literature and evidence. This chapter will also deliberate on and make interpretations of the research findings.

5.2 Revisiting the Research Question

This study set out to examine how academics integrate ICT into their teaching practice at a university in Uganda. To explore this phenomenon, the study was guided by two specific research questions. These questions were aimed at examining the beliefs, perceptions and attitudes that the participating academics held about the integration of ICT into their pedagogical practice and the influence of ICT on the educational purpose of their teaching.

From the research findings, five common themes emerged. The identification of these themes was based on the personal interviews, observation and field notes. The first theme examined how these academics were incorporating ICT into their pedagogical practices (current pedagogical practices using ICT). The second theme revealed changes in the teaching practice of the academics that were influenced by ICT (paradigm shift: changes in teaching practice). The third theme showed ICT as a catalyst for professional development and that academics were taking bold steps to equip themselves with the ICT skills required for the 21st century learner (ICT as a catalyst for professional development). The fourth theme revealed the perceived challenges in ICT experienced by the academics in their pedagogical practice. The fifth and final theme revealed the perceived opportunities in ICT that prompted the academics to integrate ICT into their pedagogical practices. The findings of this study indicate that issues

such as academics' experiences in understanding how to integrate ICT, attitudes towards technology, the perceived benefits of using technology, and the perceived challenges of using technology were important considerations in the integration of ICT into these academics' pedagogy.

5.3 Analysing the findings

In this investigation, the academics gave varying accounts of how they integrated ICT into their practice and how ICT had influenced their pedagogy. They attributed the changes in experience to their newfound passion for technology use, both in and out of the classroom. The majority of the academics experimented with new technologies that altered the way in which they delivered course material, and some used ICT simply to enrich the existing course content. From the analysis of the findings, various patterns of experience were evident. These related to how the academics' practices had changed. The subsequent sections will discuss these changes.

5.3.1 Patterns of experience

In synthesising the themes, five major patterns of experience were identified in this study to describe the changes that academics at Kusoma University had experienced in the process of integrating ICT into their teaching and learning practices. The first pattern concerned academics embracing ICT integration as part of their changing pedagogy. This focused on how the academics welcomed the use of ICT and how ICT altered their content delivery and learning styles. The second pattern was related to the resistance to ICT integration that was evident among some academics in their teaching and learning practice. The third pattern revolved around the resilience exhibited by the academics despite the challenges that they faced in the integration of ICT into their pedagogy. The fourth pattern highlighted emerging innovations, focusing mainly on the use of Web 2.0 technologies for teaching and learning. The fifth pattern concerned professional development among academics with a focus on self-organised learning experiences associated with ongoing learning and professional support.

5.3.1.1 Embracing ICT integration

During their years of teaching and learning, the academics' changed patterns relating to the integration of ICT point to a move away from the traditional forms of course content delivery.

This entailed moving towards delivery approaches that not only enriched their course content, but also enhanced their course delivery in and outside of the classroom.

- ***Change in the mode of content delivery***

The majority of the academics in this study had moved away from the use of traditional tools and methods such as overhead projectors, chalk and talk and the dictating of course notes to the students during their face-to-face classroom interactions. The academics had adopted ICT tools such as PowerPoint and Learning Management Systems (LMS) for course delivery, class interactions and digital content provision. The academics felt that the traditional teaching approaches were time-consuming and that they added little or no value to their pedagogy compared to teaching approaches that embedded ICT. The following experiences of these academics support this notion.

Some of the academics in this study indicated that their teaching approach had shifted from delivering course content by dictating notes to their students to ICT-mediated approaches, such as the use of PowerPoint presentations. For example, Magufuli felt that the use of presentation tools (PowerPoint) in his teaching allowed him to cover as much course content as possible within the allocated class time. Additionally, he felt that the integration of ICT in his teaching presented an opportunity to engage with his students in discussing the subject material. He believed that this activity not only encouraged the active participation of the students, but also ensured that the students understood the important elements of the course.

Besides the use of PowerPoint, Magufuli also used digital voice recordings of face-to-face lectures. This was intended to ensure that students who sometimes failed to be physically present in class could benefit from listening to the digital audio clips while viewing the slide presentations. This academic made digital recordings of his class sessions on audio compact discs and sometimes on cassette tapes, which he would subsequently make available to his students to replay whenever they wished. By doing this, Magufuli was able to minimise the number of repeated lectures with the students to compensate for missed classes.

Wakukyalo's experience involved the adoption of interactive lecture presentations, some of which involved browsing the websites of leading tourist destinations and undertaking virtual tours of popular tourist destinations around the world. She felt that her teaching approach provided her students with numerous opportunities for structured engagement and afforded them an opportunity to think and respond to queries that she usually posed after her brief

segments of lecture talk. This change in the way in which she presented her course content allowed her students to relate to and understand many of the concepts in her course.

Additionally, Wakukyalo routinely prepared PowerPoint presentations on leading tourism destinations abroad as part of her tourism course. The intention was for her students to visually experience these places. Wakukyalo's shift to the use of technologies such as PowerPoint enabled her students to experience the real world within the classroom context. This shift in approach enriched the students' learning experience because in previous lectures, they only discussed tourism destinations without knowing what they really looked like. Through the embedding of videos that were often sourced from YouTube, her classes changed from lecture-based content delivery to those where students actively participated in the learning process.

Another academic in this investigation also made a shift from text-based content to incorporating videos sourced from YouTube and other internet sources for his class presentations. Makyati's shift to the use of multimedia content enthused his students and kept them actively engaged throughout his interactions with them in the classroom context. As part of his changed teaching approach, Makyati had moved away from the practice of issuing hand-outs (hard copy notes) to his students. He instead referred the students to the relevant websites of professional bodies for course material on human resource planning topics that he had facilitated. This academic argued that preparing hand-outs and dictating notes had previously consumed a lot of his time, which did not make sense since this support material could be accessed by students from trusted websites. This academic reported that by embracing ICT, he was able to pay more attention to other aspects of teaching and learning (such as demonstration/illustration) other than dictating notes, a previous practice he considered as a waste of time.

The majority of the academics in this investigation argued that teaching through digital content (PowerPoint) presentations enabled them to complete the course content in the allocated time. The time saved facilitated the clarification or offering of additional examples to the students. They argued that the students did not have to take down notes during their class sessions since they now had access to electronic copies of the presentation slides. This change in teaching practice also meant that students paid more attention in class to understand the content, and that transcription errors were eliminated as all students received the same material in the form of electronic hand-outs.

The ICT-induced experiences of the academics had led them to use the university's LMS. The change in the mode of delivery of course content and interaction was noted when the academics made use of the LMS platform to make course material available to their students. Participants such as Twatoba, Magufuli and Mukyala used the LMS to post course material (digital content). The posting of digital content on the LMS changed the way in which these academics made course material available to their students (from issuing hard-copy handouts to their students to issuing electronic copies that were readily accessible on the learning platform). The LMS had eliminated the requirement for academics to make printed copies of the course material for their students, which had been their practice.

The LMS not only changed the way in which Mukyala communicated with her students, it also made it possible for her to provide her students with prompt feedback. This was as opposed to her previous practice where students handed in bulky hard copies as part of their coursework submissions. The LMS offered her an opportunity to better manage, organise, store and access her course content. While Mukyala indicated that she was not using all the features of the LMS, she felt that the available embedded functions (such as messaging and email) offered much more than was available in the traditional teaching approaches. The majority of the participants felt that the LMS had changed the way in which they interacted with their students. They also used it to accomplish administrative roles that were previously disconnected from actual teaching and learning activities.

Communication between the academics and their students had changed for the majority of the study participants. This stemmed from the fact that many of the participants in this study were increasingly engaged in online discussions and engagements in comparison to face-to-face approaches of interaction. These interactions were mainly mediated by tools such as blogs, Facebook, WhatsApp and, to a limited extent, by the institution's LMS. For academics like Twatoba, the change largely involved the way in which he collaborated with colleagues and students. Through the use of Web 2.0 technologies, he was now able to conduct online classes for the students at the satellite campuses by making use of the lecture scheduling features of tools like the LMS. He indicated that these tools made it possible for him to conduct discussions and sometimes online classes without having to physically travel to the distant university's satellite campuses. This view was also echoed by Musomesa, whose experiences showed that the LMS had obviated the need to physically travel to the university's distant campuses, which proved to be both time-saving for the academic and cost-saving for the university.

The majority of the academics who participated in this investigation used ICT to alter the way in which they delivered their course content. Even though individual academics talked about the numerous ways in which they had benefited from the use of technology, the underlying experience was that ICT created convenient and practical ways of making course content available to their students. This was important for the academics, who continued to make use of ICT primarily to enhance their teaching and improve on the delivery of course content material.

- ***Change in teaching and learning style***

The change patterns exhibited by the academics also describe the teaching and learning approaches that were adopted. These show a shift away from teaching approaches that were lecture-based and recall-orientated, with academics controlling most of the information flow. The technology approach involved teaching styles that were student-centred and cognitive process-orientated, with academics becoming facilitators in the teaching and learning process.

This investigation revealed that the academics were changing their classes from being lecturer-centred to student-centred as they opted for more ICT use in their practice. This pattern of change was evident in the academics' engagements with their students, with the majority of them adopting approaches that encouraged the active participation of the students. For example, some of the academics were keen to have a blended learning approach, classroom-(contact sessions) and online-based discussions mediated by tools such as the LMS and social networking technologies. The academics made less use of traditional didactic approaches to teaching that encouraged note-taking and students passively listening to them. Instead, they started facilitating learning that allowed students to engage in self-directed learning. This shift in the teaching approach was geared towards helping students to think independently.

The majority of the academics believed that their roles had changed from being conductors of the teaching and learning process to rather being facilitators. The facilitator's role was more noticeable in the ICT-mediated sessions, even though a considerable number of face-to-face sessions were still being conducted with academics leading the process. Change occurred in the activities offered by the majority of the lecturers. As a result, most of the tasks called for more student engagement, for example, discussions or class presentations that were student-centred. ICT-mediated tasks changed not only the means by which lectures were delivered, but also the way in which the content was structured. The alteration in teaching style was inclined

towards deepening the understanding of course content by encouraging learners to engage constructively in the discussions that were held.

The learner-centred approaches that were adopted by some of the academics created an environment that encouraged students to engage in intellectual debates for the purposes of learning. As a result, the changes in the teaching and learning style brought learning communities into the limelight. The academics' role now involved encouraging active learning with the hope that knowledge would be created through constructive engagement with and among learners. The academics ensured that the learning communities were student-centred and focused on common learning goals by periodically scheduling class activities, such as discussions, in their Facebook and WhatsApp groups.

5.3.1.2 Resisting ICT integration

This investigation also revealed patterns of resistance to the use of ICT. Two academics stood out as being resistant to incorporating the use of ICT in their teaching practice. This was further evident where these academics felt that the traditional approaches to teaching and learning still worked well for them. These patterns manifested in the form of either non-use or limited use of the available technologies by these academics, with the participants voicing particular reasons for their reluctance. Some of the academics explained that the use of ICT created more work for them and they felt that they were already burdened with heavy teaching loads.

Some of the academics in this investigation were reluctant to integrate ICT into their teaching and learning practices. Their reservations were exhibited in their preference for approaches that made little or no use of ICT tools that were available at the university. The following experiences serve as examples.

Makyati made limited use of the LMS because he felt that the system did not bring any significant benefits to the teaching and learning process. Other than communication, he did not see the need to use this technology in his teaching practice. While he acknowledged the benefit of LMS with regard to supporting interactions among academics and the student community, he reported that teaching and learning was more than simply using the learning management platform for communication and course content delivery.

The research participant Musomesa was not comfortable with the introduction of the LMS. He believed that the LMS created more administrative work, and he was not ready to take on this

additional burden. He maintained that the adoption of the LMS required significant time investment, time that he did not seem to have. His statements attested to feelings of resentment towards the LMS platform and he thus only limited his use of the tool to institutionally imposed mandatory tasks that required students' input, such as uploading their coursework submission files. His resentment of the tool seemed to be amplified by his opinion that students were equally not eager to use the LMS. He argued that his students did not have adequate access to ICT facilities (computer labs) that would enable them make use of the LMS, something that also discouraged him from using it.

Musomesa also resisted the use of blogging tools, even though he had heard about the successful use of these tools from colleagues during training workshops and in their informal interactions. The reluctance to use this technology could be attributed to his preference for the traditional teaching approaches of chalk-and-talk over ICT mediated approaches, such as blogging. These seem to fit in with his beliefs and attitudes towards the non-integration of ICT into his teaching.

This investigation revealed that some of the academics did not welcome the idea of using social media tools such as Facebook and WhatsApp in their pedagogical practice. Even though academics, like Makyati, had learnt about the affordances of these technologies through interactions with other colleagues, they still declined to use them. Makyati was concerned with keeping his social life separate from his students. He believed that the use of Facebook would fuse his academic and social lives, which he felt would infringe on his personal life and privacy. Some academics raised ethical questions about the professional relationships between academics and students on social media platforms. Their reluctance to adopt these technologies indicated that they were still comfortable with conducting their practice in the conventional way and, as such, resisted any technology that would alter their teaching methods.

5.3.1.3 Resilience in the use of ICT

Patterns of resilience were also evident among some of the participants in their pursuit to integrate technology into their teaching practice. Even though the process of integrating ICT into their practice was characterised by numerous challenges, they were relentless in their pursuit to incorporate ICT into their teaching practice.

Some of the academics were determined to work with the available ICT tools that they believed added value to their teaching and learning practice. Mukyala, one of the participants in this

investigation, was keen on making technology work in her teaching practice. She tried using Facebook Live as a way of engaging students in her course. She recounted numerous instances where her Facebook Live broadcasts were hampered by low bandwidth connectivity, which led to the buffering of her live streaming sessions. Even though such occurrences were common, this academic was not deterred from making use of social media in her teaching practice. Mukyala argued that many of her students owned internet connected mobile devices, such as smart phones, that enabled them to access live streams and all sorts of course material almost instantly on and off campus. This motivated her to continue improvising with such technologies since they offered better and more convenient ways to engage students as compared to the conservative teaching practices of chalk and talk, which required physical presence. Similarly, Loketo was relentless in his quest to engage his students via Facebook Live sessions despite reporting similar frustrations with low bandwidth that sometimes failed during his online broadcasts. The effort and perseverance that these academics put into using social media as a mode of instant communication demonstrated their resolve to make these tools work. These academics hoped that students and colleagues would eventually appreciate this form of interaction.

The lack of access to ICT infrastructure at home and in some areas of the university campus did not deter these faculty members from using technology in their practice. Their resilience prompted them to explore alternative ways of accessing ICT resources. The participants, i.e. Magufuli, Twatoba, Loketo and Mukyala, had acquired personal internet modems to ensure that they were reachable online wherever and whenever it was necessary. They also encouraged their students to acquire modems and internet connections to be able to interact with them on and off campus. Even though they indicated that the internet connection charges were costly, they were still willing to make personal sacrifices where the university was not able to provide them with unfettered access to these services. These experiences of the academics demonstrate their resolve to make ICT work for them and their students.

Wakukyalo was another participants who was determined to make use of ICT against all odds. She reported instances where she had prepared to work with ICT in her class sessions only to be let down by power outages or a lack of campus internet connectivity. Even though this happened on many occasions, it did not stop her from preparing PowerPoint slides for her classes. She indicated that on numerous occasions she had to deal with power outages, internet connectivity challenges and hardware malfunctions, which prompted her to explore alternative

approaches (such as rescheduling her class sessions to such a time when she would be able to use technology) for teaching. The determination of many of the academics in this investigation demonstrated their resilience to integrate ICT into their practice, even in the face of inhibiting factors that challenged their practical use thereof.

5.3.1.4 Emerging innovation

This investigation revealed that some of the academics had begun exploring the use of social networking technologies in innovative ways that were seemingly new in their teaching and learning context. Most significantly, the academics felt that students were already part of the social media revolution. They felt that it was easier for them to introduce new teaching approaches using technologies that students were familiar with (for example, students seemed to be comfortable when electronic handouts were shared using Facebook groups). Facebook, WhatsApp and the use of blogging technologies were prevalent among some of the participants in this study. Academics like Loketo and Magufuli explored the use of Facebook for the dissemination of course content and for discussions in some of their courses. They viewed Facebook as an ideal substitute platform for the LMS. This may be attributed to their previous negative experiences with the LMS that had led these academics to cease using the platform for teaching. The academics argued that the LMS was not user friendly as it required a considerable amount of time to use and was also characterised by a steep learning curve. In addition, it was very slow in terms of uploading course content, largely due to the low bandwidth connection.

Wakukyalo made use of social networking tools because she believed that such tools reinforced the available interaction channels. The academics argued that unlike some of the technologies, such as the institution's LMS that was unstable and thus not dependable, social media was a more popular, flexible, accessible and convenient way of reaching out and staying in touch with their students. Even though networking sites such as Facebook were popular among academics and students, the lecturers indicated that they were just beginning to explore their use in teaching and learning and that their experiences were promising and rewarding.

It emerged from the study findings that some of the academics created Facebook groups as a learning platform to provoke their students into starting or continuing discussions on various course topics. These Facebook groups also facilitated the discussion of topics that may have seemed complex. Academics like Magufuli found that these innovations enabled the creation

of an environment that was both participatory and yet user-friendly. They believed that the students would be more comfortable expressing their views regarding the course topics at hand without the rigidity associated with the physical classroom setting and the institutional LMS. The majority of the participants in this investigation indicated that there was a noticeable change in face-to-face classroom discussions and online engagement when innovative social networking technologies were used. Online discussion groups were more vibrant, with more frequent questions and clarifications being sought by many of the student members, a trend that many academics had noticed.

Two academics in this investigation made the transition to more advanced and innovative use of technologies for teaching and learning. They were exploring new ways of interacting with their students when they started using Facebook Live's streaming feature. Both Mukyala and Loketo were technology enthusiasts who were keen on experimenting with streaming video in their instructional practice. Mukyala was initially reluctant to explore Facebook Live as a means of interacting with her students. This was apparently attributed to the fact that the live streaming feature was relatively new to her and she did not want to venture into the use of a technology that was unfamiliar to her. Her desire to conveniently engage and interact with her students, combined with her previous experience in using the WebEx tool (video/audio conference web application), had culminated in her exploring synchronous broadcasts (presentations) and discussions using the Facebook video streaming feature. Through the use of Facebook Live, she was also able to provide real-time feedback by responding to students' questions during the broadcast.

Loketo was another academic who explored Facebook Live's streaming video feature. The synchronous nature of this service was appreciated by both the lecturer and the students. Just like Mukyala, Loketo also had doubts about using this technology. However, repeated requests by his students prompted him to try out the live broadcasts. Loketo believed that the convenience and excitement that this technology brought to his classes had motivated him to consider this approach as part of his repertoire for interacting with the students.

These academics were appreciative of the active participation of their students during their interactions. They noted that the live broadcasts had a great potential for scaffolding learning as the students seemed to find them more thought provoking than the traditional face-to-face class meetings and the LMS. The synchronous nature of these interactions meant that the students had the opportunity to ask questions that they would have otherwise failed to ask in

the physical face-to-face classroom setting. Furthermore, they indicated that the synchronous nature allowed for feedback to be provided almost immediately. The narratives of these academics allude to a new experience of integrative social networking technologies in the higher education context.

The participants in this study also reflected on their experiences with using social networking tools such as blogs. The majority of the participants had used blogs for collaborative and reflective purposes. Magufuli was one of the academics who made use of blogs. He expressed his preference for blogs, arguing that they were conversational in nature, which made it possible for the participants to follow a conversational trail. Mukyala believed that the use of blogs to interact with students further reduced the teacher-student interaction gap and allowed students to express themselves more freely, as opposed to the LMS, which was considered too formal and rigid.

Both Loketo and Twatoba argued that the blogs offered a unique opportunity for academics to interact and collaboratively share their experiences with colleagues and researchers in their areas of interest. Some collaborative efforts had grown from simply networking with academics from other institutions to researching and joint publishing. Even though they pointed out that blogging was a time-consuming and costly practice, they believed that the effort invested in blogging was worth it. The majority of the academics felt that blogs offered important approaches to knowledge construction since they allowed for the exchange of ideas through feedback.

Mukyala and Wakukyalo had used blogs for reflective teaching purposes in their courses. These participants argued that they used blogs to rethink their teaching approaches and also to provide quick feedback on some of the class assignments. Mukyala believed that the blogs provoked students to think critically and also reinforced learning by allowing her students to reflect on the knowledge acquired as well as link application to practice

Furthermore, Wakukyalo and Mukyala had used blogs to promote self-directed learning among their students. They were of the opinion that blogs ensured that the students took control of their own learning. Blog comments provoked thoughtful responses, an indication that students had started engaging in critical thinking. Wakukyalo was convinced that the quality of academic debate had improved among her students as a result of using this technology

innovatively for teaching purposes. Like many of her colleagues, she felt that making use of blogs was one of the most practical and easiest ways for her to stay connected to her students.

Furthermore, the academics in this investigation made use of mobile messenger apps, such as WhatsApp, for communication. Loketo and Makyati had used this technology to instantly pass on coursework information to their students. Although WhatsApp messaging allows for audio, text, image and video messages to be communicated to the student members of WhatsApp groups, it was used mainly for short message communications to clarify issues or student queries that were urgent in nature. The use of such technologies by academics demonstrates their shift to innovative practices in teaching and learning, and their desire to use new ways of interacting with their students to enhance learning.

5.3.1.5 Professional development

The professional development patterns exhibited by the academics in this study illustrate the numerous means used to acquire the necessary skills for ICT integration. The majority of the participants in this study had expended a considerable amount of their time and energy in developing their ICT skills as a self-learning exercise. Most self-taught ICT skills had been acquired through constant practice and the trial-and-error strategy, which became part of the academics' repertoire to make use of technologies as a means of innovating their teaching.

This investigation revealed that the academics were intrinsically motivated to acquire ICT competencies and skills. This led them to explore and experiment with various computer technologies that could be used to enhance their practice. The academics devoted time to learning applications such as word processing and presentation tools after official working hours. Some participants (Makyati and Loketo) even took leave from teaching to improve their ICT skills. Not only did they focus on learning basic ICT skills, they were also concerned with developing competencies and confidence in the use of new technologies that they planned to apply in their teaching practice.

All of the academics in this investigation demonstrated ICT competency in using electronic presentations and this was evident in their teaching. Some of the participants demonstrated competence in the use of Web 2.0 technologies for discussions, and blogging became a common feature in their daily practice. The majority of the academics expressed enthusiasm in trying out innovative technologies as long as they believed it would enhance their teaching pedagogy.

This investigation also revealed that there were systemic efforts by the university to ensure that the academics were equipped with the prerequisite ICT skills for their teaching and learning practice. Numerous workshops and training sessions had been organised in basic computer skills and on specific ICT tools, such as the LMS. These were aimed at ensuring that the academics were in a position to use these technologies to foster the university's goal of being an ICT-driven institution. However, institution-initiated training sessions seemed to have a minimal effect on the skills attained by the academics.

5.4 Echoing the Literature

This study revealed that there were similarities between the findings in this investigation and that of the extant literature. This section discusses how the current research findings affirm what is already known about this field of study. This is done by highlighting the issues under the different themes that were found to be comparable to previous study findings.

5.4.1 Current pedagogical practices of ICT

- *Reliance on proprietary software*

This investigation revealed that academics' perceptions and attitudes towards the integration of ICT into their pedagogical practice were mostly positive. The majority of the study participants integrated ICT in ways that enhanced their teaching and learning experiences. The academics used proprietary software as a productivity tool, mainly for lesson preparation and delivery. The most common software use included Microsoft PowerPoint for class presentation slides and Microsoft Word to prepare both electronic and hard copy hand-outs. Visual illustrations such as YouTube videos were often embedded in PowerPoint presentation slides as a way of enriching course material. This study provides evidence that the participating academics at Kusoma University were determined to replace most of their old teaching material – “yellow notes” – with enriched content and better course delivery approaches. These study findings are corroborated by the works of Opati (2013), who finds that faculties primarily use ICT as a tool for lesson preparation and record management. This is also confirmed by Lindsay (2006), who asserts that lecturers at a British university predominantly employed ICT in the preparation of presentations and guiding students towards online reading material.

Drawing from the findings of this study, I argue that the academics integrated ICT largely through approaches that made use of the available ICT tools, such as Microsoft Suite

applications, to boost their productivity. The academics believed that the integration of presentation tools such as Microsoft PowerPoint into their practice facilitated the quick and efficient delivery of curriculum content. The findings reveal that perhaps this was the most important advantage that was accrued from the academic use of ICT in their pedagogy. Those that used ICT placed emphasis on the delivery of curriculum content and not necessarily on knowledge construction. This study also provides evidence that, through the integration of ICT into their teaching practice, the academics were in a position to cover more course content in their class sessions and, thus, save on time. The use of proprietary software such as PowerPoint gave them the opportunity to preview their presentations with a view to properly planning for the duration of their presentations and content coverage. This finding is similar to that of Jacobsen (2000) in which faculties were motivated to use ICT to improve course material delivery with no real attention to learning issues. Rampersad (2011) also argues that ICT helped academics to maximise content delivery and get more done in the prearranged class time, consequently allowing for faster completion of the curriculum.

Christie and Garrote (2011), Fanghanel (2007) and Garrote and Pettersson (2007) in their studies on the use of ICT within universities indicated that the LMS had been used by academics extensively as a one-way, asynchronous provision of course material to their students, more commonly for the purposes of adding notes, timetables and course outlines. Their studies show that students were on the receiving end and the LMS was not necessarily used in the context of conversation and interaction. Similarly, this study provides evidence that the majority of the academics used the LMS for the delivery of course content material and the provision of feedback. This study demonstrates that although the LMS had features that supported group work by providing collaborative work spaces, the academics made very limited use of these functions, preferring to use the tool as a repository of course material.

The academics acknowledged the importance of staying in touch with their students after their face-to-face classroom sessions. In addition to Facebook, messenger apps like WhatsApp were commonly used to ensure the continuity of conversations on and off the university campus. These tools were also used to quickly convey information to students about course activities or to clarify course assignments. The instantaneousness of these practical communication tools enabled the academics not only to provide feedback to the students, but also to actively engage them in learning activities that scaffolded learning. The academics also argued that students' enthusiasm to learn often increased, having been provoked by the online discussions. These

findings are consistent with the works of Greenhow and Lewin (2016), who explain that social media technologies have the potential to bridge formal and informal learning spaces with varying attributes of formality and informality. Crook (2008) posits that “Web 2.0 tools facilitate inter-subjectively rich and open dialogue environments which can help shape the trajectory of learning as an exchange of strategic guidance” (p. 31).

The academics also reported the possibility of real-world teaching, which enhances students’ active involvement practices and thus scaffolds learning. They argued that the use of graphics, multimedia and other digital teaching aids enhanced students’ understanding of course material and allowed the students to visualise contexts in ways that scaffolded learning. Montrieux, Vanderlinde, Schellens and De Marez (2015) had similar findings concerning the use of mobile technologies, such as tablets, in teaching and learning. They report that the instructors felt that these tools promoted differentiated learning styles. The findings of this study confirm that the use of ICT in teaching and learning allows for learning activities that were previously inconceivable. These findings are consistent with the works of Bonk and Kim (2006), who argue that ICT affords faculty members the possibility of exploring concepts in numerous ways (for example, the use of simulated tasks of real-world activities). Furthermore, Tiernan (2015) posits that the visualisation of the YouTube videos often embedded in PowerPoint presentations provides students with greater learning gains by illustrating concepts that cannot be easily observed by traditional means, a finding that is echoed by Justus (2017).

- ***Ambivalence towards an LMS***

This study revealed that platforms such as the LMS were being used by the academics at this university to share enriched course material (embedded with auditory and visual illustrations) in the form of presentation slides with a view to making course material more accessible beyond the classroom. The academics argued that the LMS improved interaction in the form of communication and discussion with their students, in addition to facilitating the management of their modules. The faculty members reported that the LMS enabled them and their students to connect beyond the formal classroom walls and beyond the physical confines of their university.

LMS use by some of the academics in this study highlighted the importance that the participants attached to the LMS as a platform that augmented their teaching. The academics felt that it was a support system that made course information available to students at any time. This was

particularly important in supporting students who had difficulty attending scheduled face-to-face lecture sessions. Asiri (2012) also underscores the LMS as a tool that enables educators to deliver course material to students, to register students for their course, to design courses and teaching approaches, to communicate with learners synchronously and asynchronously, as well as to participate in the evaluation of students' performance. The findings of the current study are quite similar to those of Fry and Love (2011), who assert that the majority of lecturers looked to LMS mainly to disseminate course information. Similar findings were reported in the works of Christie and Garrote (2011), who argue that faculty, for the most part, used the LMS to upload the required reading, course content and PowerPoint presentation slides for their face-to-face classroom sessions.

This study also revealed that, even though the university had invested in a learning management system for instructional use, some of the participants in this study were hesitant to use the platform. This was attributed to numerous factors, namely, poor ICT infrastructure, which was characterised by low bandwidth connectivity, power outages at the institution and the fact that some of the participants were not very familiar with the functionalities of the LMS tool, apart from simply uploading course content. They viewed the LMS merely as another content delivery channel and nothing more. In a study by Justus (2017), faculty members cited the extensive learning curve required for some of the technologies, besides ignorance about the new approaches that were available for effective instruction as primary challenges to ICT integration.

- ***A shift to Web 2.0 technologies for teaching and learning***

In the current study, Web 2.0 technologies for teaching and learning were widely used by academics and students respectively. The findings reveal that the participants found technologies such as Facebook, WhatsApp, Blogs and YouTube useful for educational purposes. The academics used social media tools to communicate, collaborate and actively engage with their students in the virtual world. Similar findings were highlighted in a study by Brown (2012) in which several benefits were accrued from the academics' use of Web 2.0 technologies. These included sharing research ideas, improved discussions, and improved student participation, among others.

This study provides evidence that some academics used social networking technologies as platforms for improved communication, for example, Facebook was used for teaching and

learning, which was possible through the use of distinct built-in functions that offered social, pedagogical and technological affordances. The academics shared course material and engaged in group discussions and collaborations. This finding is consistent with that in the works of Seechaliao (2014) and Zelick (2013), who assert that the use of social media offers valuable tools that support educational communications and collaborations among lecturers. I argue that the exchange of ideas and information through Web 2.0 technologies augmented learning since both academics and students were bound to critically think and reflect before responding to online arguments.

The findings of this investigation reveal that academics' use of social media, such as Facebook, Blogs and WhatsApp, created communities of practice among students, encouraging them to discuss, share ideas and grow academically. The academics usually guided and monitored these discussions and used these social media tools (WhatsApp, Facebook) to post notes and to remind students about assignment due dates. The academics also used the media tools as a platform for students to support each other and to seek clarity on specific tasks in their courses. The academics in this study argued that learning occurred in these communities through the active participation of members on numerous course activities and group assignments that were posted using Web 2.0 technologies. The participation of the academics in these online set-ups served to guide the learners and to share knowledge from an expert point of view. This is in line with Downes (2007) assertion that "conversations in communities of practice form a rich tapestry of resources that are dynamic and interconnected, created not only by experts but by all community members including learners" (p. 4).

In the current study, the academics indicated that undergraduate students expressed more enthusiasm as compared to post-graduate students in making use of Web 2.0 technologies and that their online communities promoted classroom communities of practice. This finding corroborates earlier findings by Hung and Yuen (2010), who report that students developed a strong sense of social connectedness and conveyed positive feelings regarding their learning experiences in classes where social networking was used as a supplementary tool. Furthermore, Justus (2017) posits that social media tools such as Facebook were used by faculty members primarily to support social collaborative learning, as well as to build a sense of community in the form of Facebook groups.

Some of the academics reported that social networking technologies allowed them to interact with their students in a setting that was friendly and one that allowed for the exchange of

constructive ideas, specifically when blogs were used to brainstorm some of the course topics. The academics indicated that through these interactions, they were able to receive feedback that was used to improve their course content and teaching approaches. The results show that the academics used ICT innovatively to provide authentic learning experiences where they are able to construct and share knowledge in a media-rich environment. The current study's findings are consistent with the available research (Clark & Luckin, 2013; Kim et al., 2011). The academics noted that the integration of ICT marked a shift in learning, which was not amenable to all of the students. The undergraduate students were more flexible with respect to the introduction of innovative practices by academics that made use of ICT, whereas the older students seemed rigidly against changing their study habits.

In summary, the findings of this study are consistent with Brown's (2012) study on the educational potential of ICT tools. Brown avers that ICT allows for instant access to online course material anytime, anywhere, and the use of multimedia to gain a better understanding of course material. The academics in this study argued that the ubiquitous access to Web 2.0 technologies enhanced the way in which they interacted and communicated with their students. While the academics were determined to adopt the use of Web 2.0 tools for instructional purposes, some argued that live streaming technologies were challenging to integrate into instructional practice owing to the low bandwidth in the university context. A lack of the necessary ICT skills, as was revealed in this study, also hindered faculty members' use of these technologies. Similar findings have been reported by Daher and Lazarevic (2014), whose investigation on the challenges of some lecturers using Web 2.0 technologies revealed that a lack of training opportunities was the main inhibitor to using Web 2.0 tools. The academics in this investigation echoed similar concerns as they averred that training opportunities were poorly scheduled and not tailored to their teaching needs. In a study conducted by Gaffar, Singh and Thomas (2011), it was concluded that prohibitive internet technologies, poor technological infrastructure and unreliable electricity were to blame for the low uptake of ICT in most African countries, a finding that was echoed by most of the academics in this study.

5.4.2 ICT paradigm shift: changes in teaching practice

The findings of this study give insight into the manner in which ICT tools were employed by the participating academics at Kusoma University. In response to the original research question, the study more explicitly addresses how ICT influences the educational purpose of academics' teaching in terms of teaching style and pedagogy in the classroom.

- *The evolving pedagogical role versus the curriculum delivery strategy*

Traditional teaching and learning approaches have emphasised content delivery and academics have predominantly taught through face-to-face lecture presentations, sometimes interspersed with learning activities and tutorials designed to rehearse content (Oliver, 2002). However, this study shows that these academics were beginning to rethink their role in the classroom setting as a result of integrating ICT into their pedagogical practice.

The majority of the academics in this study indicated that their teaching practices had shifted from being lecturer-centred to being student-centred. The academics indicated that they were now repositioning themselves as facilitators who guide learning and were no longer the ‘know-it-all’ dispensers of knowledge as was characteristic of more traditional educational practices. The results of this study are in line with previous research conducted by Amin (2016), who posits that faculty’s role was shifting from mere preaching to mentoring so as to ensure student learning and to motivate both fast and slow learners in the digital era. The results indicate that the academics were becoming co-learners and contributors to the interpersonal and social development of students through the use of Web 2.0 technologies for discussions and collaborations.

The majority of the academics in this study believed that there was a need for a shift to educational practices that fostered lifelong learning, which created new networks for dialogue, and contextual applications of the learning in the real world, as well as reflection. Their adoption of Web 2.0 technologies, and more so Facebook Live, marked a change in the way in which they interacted with their students. By creating communities of practice, for example, through Facebook groups, they intended to promote collaboration and foster dialogue among the student community. This revelation ties in with Siemens and Mattheos' (2012) argument that the new purpose of education is to assist learners in communicating with each other, exploring new and relevant information for the task at hand, and being co-learners with academics in diverse settings that go beyond the confines of the classroom.

Linn and Eylon (2011) and Cooperstein and Kocevar-Weidinger (2004) have argued that the use of ICT in the classroom can support constructivist learning approaches. However, ICT integration in the classroom does not mean that a radical change in didactic practice will take place (Windschitl & Sahl, 2016). The findings of this study lend credence to earlier findings by Yelland (2006), who argues that learning with ICT is more than simply digitising learning activities, rather, it ought to create contexts that allow for authentic learning experiences where

ICT is integrated in ways that are meaningful. This will not only enhance knowledge production, but also the dissemination and communication of ideas. Some of the academics in this study agreed that pedagogical change was something that required substantial thought and effort and that the introduction of ICT in teaching was simply not enough for meaningful learning to take place.

The findings of this study indicate that the participants practiced both lecture-centred and learner-centred approaches to teaching and learning. The lecturer-centred academics were those whose beliefs hardly changed, even after integrating ICT into their practice and, as such, their teaching approach did not change. These academics continued to execute their roles in the same traditional way. This indicates that what had changed was simply the replacement of the traditional delivery methods of chalk and talk with ICT tools such as data projectors and PowerPoint presentation slides. It is evident from this study that ICT did not alter the power dynamics between the academic and the student in terms of interactions, expertise in terms of knowledge, and the structure of the learning experience remained under the control of these academics.

The results of this investigation show that ICT integration practices provoked the entrenchment of conservative practices among some academics. The class observations showed that the availability of ICT tools did not lead to fundamental changes in teaching. This study reveals that the participants mainly employed ICT to enhance the delivery of course content without necessarily changing their pedagogy. This is contrary to the overall intention of integrating ICT into teaching and learning (Browne et al., 2006; Keane et al., 2016; Shelly et al., 2006). Instead of ICT revolutionising education practices, ICT seemed to have strengthened the traditional instructional structures that are characteristic of ancient didactic models. ICT should be integrated in such a way that it fulfils its potential in enhancing pedagogical practice. While it is claimed that ICT can lead to fundamental shifts in academic practice (Weller, 2011), this study confirms that much of the technology employed in higher education has served to replicate or supplement traditional practices rather than transform teaching (Kirkwood, 2009). Sunal, Hodges, Sunal, Whitaker, Freeman, Edwards, Johnston and Odell (2001) posit that change in faculty members' teaching practices will not happen unless they encounter disappointment with their current philosophies of teaching.

In contrast, the innovative academics were those who used ICT but adopted the role of a facilitator. They indicated that the use of ICT had altered their teaching approach and that they

were now able to organise a wider range of learning activities that involved the use of multimedia and the creation of interactive tasks, among others. These academics were inclined to use more instructive applications such as blogging tools and Facebook Live in addition to text processing tools. They believed that teaching and learning should be understood as an active learning process that required students to reflect on the link between the aim of a lesson and the specific applications thereof.

The findings of this study show that the academics' perceptions were generally positive with regard to the integration of ICT into teaching and learning. The academics reported that possibilities existed for enhanced engagement with learners and increased communication between themselves and the students, as well as among students. Some of the participants in this study indicated that access to and the use of social networking technologies and the web tools in general made collaboration and idea sharing between academics and students much easier. The communication level favoured by the available ICT tools is indicative of some of the changes in the teaching and learning landscape and a shift in the academics' role to that of a mediator and facilitator of student learning. These findings are supported by Ahmad (2015), Shelly et al. (2006) and Makrakis (2005), who assert that ICT helps educators to vary their teaching styles and also facilitates change in teaching approaches so that new pedagogy, supported by ICT, boosts and enhances teaching and subject knowledge.

This investigation has revealed that the academics had the desire and will to learn from their students. Thus, learning became a two-way process where the academics encouraged the students to add important information to the discussion, and they would then moderate and provide guidance to realise meaningful interactions. The members (academics and students) of a group collectively helped each other towards achieving a pre-established goal. Garcia and Ferreira (2014) aver that knowledge is acquired through the meaningful interactions between academics and students. Furthermore, this study reveals that the Facebook and WhatsApp groups that had been created allowed room for group and individual learning through the interactions.

The academics were amenable to deliberating on pertinent topics and contemplating significant helpful contributions from learners, which underscored their role as facilitators. The academics no longer perceived themselves as simply learning content providers. Despite the challenges that they encountered, the academics were motivated to be more creative in order to overcome these obstacles. Their attitude demonstrates their commitment and resolve to integrate ICT in

order to realise change in their pedagogical practice. The academics had come to appreciate the fact that students were an integral part of the social media revolution and, as such, identified the need to actively and constructively engage with them through social media for academic purposes. ICT was being employed for both academic and administrative roles and, more importantly, for communication with both learners and lecturers. The academics in this research were aware that ICT integration in teaching and learning would epitomise the future of higher education.

- ***ICT catering to various learning styles***

This investigation revealed that most of the academics in this study employed different ICT tools and teaching approaches to cater to the different learning needs of their students. The academics argued that they needed to find avenues for innovatively tapping into the natural curiosity of their students using ICT tools. This would allow them to actively engage their students and encourage self-directed learning among students. The majority of the academics made use of Microsoft PowerPoint presentations with embedded visual illustrations such as videos and illustrations that were sometimes sourced from YouTube that catered to both auditory and visual learners. These findings demonstrate the academics' resolve to utilise technological aids alongside innovative teaching strategies to make the teaching and learning process more interesting and effective. Studies conducted by Barton (2004) show that visual aids such as video illustrations have been used to elucidate difficult concepts among students. Rasul, Bukhsh and Batool (2011) argue that ICT has the potential to integrate audio and visual multimedia, which appeal more to students because of its visual and auditory impact. Additionally, Justus (2017) avers that faculty incorporated YouTube videos into their lectures to enhance students' understanding of course material. He further explains that videos are more likely to be remembered when used in classroom instruction.

The results of this study show how Web 2.0 technologies were connecting the academics and their students to online resources. These technologies were facilitating changes in academic practice, from approaches where academics controlled knowledge to active, student-centred learning models where emphasis was on student participation. The academics placed emphasis on student contributions, collaborations and the students' ability to create their own knowledge in their own space. The findings of this study lend credence to the earlier findings of Del Moral, Cernea and Villalustre (2013), who aver that the use of social networking technologies has brought about changes that have redefined the teaching-learning process. This is specifically

in terms of knowledge distribution over connected networks where learning involves the recognition of relevant information patterns and the construction of new connections. Downes (2007) contends that “knowledge is distributed across a network of connections, and therefore learning consists of the ability to construct and traverse those networks” (p. 1). The majority of the academics in this study were keen on introducing modern approaches to teaching and learning that brought students to the forefront in locating, presenting and creating relevant knowledge. The participants in this study indicated that they were leading students to supplementary online material, which allowed for self-directed learning. This practice among academics not only simplifies the learning process but also makes it relevant since it is assumed that knowledge and expertise reside in networks (Siemens, 2005).

The participants in this study used Web 2.0 technologies such as Facebook and WhatsApp for the delivery of text, images, audio and visual content. The academics indicated that through the World Wide Web, students were able to access and make use of course material, which was shared using social media. This implied that students could easily access these online resources on demand. It was found in this study that the use of social networking allowed for flexibility in learning and delivery, where students had the option to revisit subject material at their convenience (anytime and anywhere), thus providing them with opportunities to take responsibility for their own learning. In a similar study on the use of social networking technologies and digital media, Thomas and Thomas (2012) posit that the integration of social networking technologies and digital media in education practices affords users flexibility, reach and immediacy. Social media platforms such as Facebook can be used to drive conversations and topics related to current academic debates in the teaching and learning process. Menkhoff et al. (2015) aver that Web 2.0 tools such as Twitter have the ability to enhance teaching and learning by providing avenues for discussion among students and academics, thus enriching the teaching and learning process regardless of time and place. These discussions may be guided initially by academics and supported by the university, but managed by students.

This investigation revealed that some of the academics in this study made use of Web 2.0 technologies such as Facebook and blogging tools, which encouraged collaboration and interactivity between online applications and students. Some of the academics mentioned that they used websites with links to multimodal texts (video, audio and virtual tours) and sites such as Facebook, all of which allowed users to categorise and tag uploaded data. The results show that participatory learning (through online groups that were mediated by Facebook and group

chats on messenger tools such as WhatsApp) was clearly discernible and that students were actively involved in the learning process. This was attributed to academics' adoption of a student-centred approach to teaching and learning, supported by their use of social networking tools like Facebook and blogging. These findings are similar to the results of a previous study conducted by McLoughlin and Lee (2007), who found that lecturers' use of Web 2.0 technologies ,such as blogs, allowed learners to control their own learning facilitated by a raft of tools, thus providing students with unprecedented opportunities for learning.

The findings of this study show that the majority of the academics believed that the active involvement of students in the learning process ensures that students become co-creators of knowledge and that this in itself allows for autonomy of thought to flourish, which they considered an essential 21st century skill. This finding is consistent with claims by Ananiadou and Claro (2009), who argue that educators' use of ICT facilitates the development of 21st century skills such as the capacity to "apply knowledge and skills in key subject areas and to analyse, reason and communicate effectively as they raise, solve, and interpret problems in a variety of situations" (p. 7). Some of the academics in this investigation argued that student involvement in the teaching and learning process, mediated by ICT, altered students' reliance on academics for the provision of the entire course material, as was the case in the traditional education system, which was characterised by 'spoon feeding'.

Furthermore, some of the academics were of the opinion that learning should allow students to critically engage with the subject content instead of simply rote learning facts. The academics claimed that ICT-mediated lectures facilitated higher-order thinking and reasoning, and that realistic lessons could be offered so that students were in a position to learn in an active manner. The views of the academics in this study are corroborated by Montrieux et al. (2015), who posit that the innovative behaviour of educators is associated with the need to rethink existing didactical practices. They also argue that such educators believe that the introduction of ICT in higher education is a good approach to preparing students for a rapidly changing world where technology is pivotal. As such, ICT integration facilitates a shift towards active, student-centred learning practices.

While the academics were cognisant of the need to adopt appropriate approaches to teaching and learning, it was noted in this investigation that instructional activities were executed from the academics' viewpoint and were focused on the preferences and teaching style of the academics. The findings show that the academics determined the design of the learning

environment and the nature of activities. The academics relied on teaching methods that they believed were most appropriate for the delivery of course content to their students. Some of the academics indicated that the face-to-face approach was their preferred teaching approach since they were not that comfortable with the transition to some of the available ICT tools. Similar findings by Dede (2008) indicate that the majority of faculty members were comfortable with the face-to-face approach of delivery and that their learners were expected to follow suit.

The participants in this study also indicated that the great student numbers in some of their online classes did not favour the use of particular technologies. Blogging, in particular, seemed to be a problem in that discussion threads would sometimes be excessive and it was thus difficult to keep track of a particular conversation. This finding is consistent with the work of Hossain and Quinn (2012), who found that “the discussion was hard to follow, would have been easier if the threads were separated” (p. 6). This was in reference to the use of blogs for teaching at a university in the western United States.

- *Perceptions of changing student attitudes*

The academics indicated that students appreciated the use of ICT to enrich course material for teaching and learning. The findings of this study reveal that the participants made use of available technologies to enrich and update electronic course material for their students’ use. For example, the embedding of videos and images in lecture presentations was believed to enhance student learning. The use of ICT by these study participants allowed students access to course material anytime and anywhere, thus providing flexibility and convenience in learning.

The academics in this investigation perceived that students’ enthusiasm to learn using ICT was heightened when academics adopted the use of ICT in teaching and learning. The academics stated that undergraduate students were more optimistic about the integration of ICT into pedagogy, and seemed to be more active in class discussions that were ICT mediated. The academics believed that these students found learning boring when ICT was absent because they would spend most of their class time taking down notes, resulting in little opportunity for interaction with the lecturer. Similar findings were made by Kirschner, Wubbels and Brekelmans (2008), who explain that ICT plays a key role in stimulating students’ interest in learning. Al-Sharqi, Hashim and Ahmed (2015) and Balanskat et al. (2006) show that ICT provides an environment that is more conducive to teaching and learning, which gives an opportunity for students to be more actively engaged and involved in lectures. The academics

in this study welcomed the integration of ICT into their teaching practice as a way through which students' motivation to learn could be improved and their interest and engagement in the learning process stimulated.

The majority of the academics in this study stated that the introduction of ICT in their practice had facilitated a paradigm shift from rote learning to engaged learning. This was mediated by social media and multimedia, all of which created a more convenient and conducive environment for learning. The academics reported that students were more inclined to share information and collaborate with each other using ICT, typically when social networking tools such as Facebook and WhatsApp were employed. The academics believed that the convenience and ease of use associated with the networking tools promoted students' discourse and collaboration with each other, which scaffolded learning. These findings echo those of Roehl, Reddy and Shannon (2013), who maintain that ICT affords students an opportunity to learn conveniently at their own pace, which may allow them to understand the course content better.

Some of the academics in this study had serious concerns about the use of social networking tools as a teaching strategy. These tools played an important role in the improvement of communication with students, and provided students access to content anytime, anywhere. This ubiquity of access to course content led some academics to express feelings of discomfort because they had to respond to students' online queries beyond the physical classroom. Learning was no longer confined to the classroom, and some of the participants considered this as an infringement on 'family time' and as such felt that their work life became entwined with their personal lives. Furthermore, the use of pseudonyms by some of the students sometimes led them to be disrespectful in their communications with the academics since they could not be readily identified. When Facebook groups were created by the academics, the students joined the online class groups with their already existing Facebook accounts, which they may have created for purposes other than learning. As such, their social behaviour in the other informal groups seemed to be replicated in the class groups. Sugimoto, Hank, Bowman and Pomerantz's (2015) study confirms that social networking sites (like Facebook) have contributed to the blurring of boundaries between personal personas and professional personas and that these are now viewed as extensions of on and off-campus lives. Prescott (2014), avers that the use of Web 2.0 tools like Facebook for educational purposes present new legal, ethical and professional challenges for academics as well as students, and that it was complicated to assign who should be accountable for their actions online.

The findings of this study indicate that the decision of the majority of the academics to use ICT in their teaching and learning practice was most likely influenced by accessibility to ICT tools in the form of hardware or software. However, there is evidence that the academics' belief in their capacity to work effectively with ICT also influenced the usage of ICT in their practice. Although the majority of the academics in this study did not doubt their ability to make use of ICT in teaching and learning, they were not confident that they could effectively integrate ICT in the classroom. The academics indicated that they were not that comfortable with some of the ICT tools (for example, the LMS) and, as such, made little or no use of these tools. Alghamdi (2016) and Bingimlas' (2009b) findings also show that the decisions made by educators regarding the use of computers in teaching and learning were likely to be influenced by factors such as accessibility to ICT and personal capabilities, among others. This study's findings are also similar to those of John (2015), who argues that while many educators have positive attitudes towards the use of instructional technologies, they do not necessarily believe in their own ability to make use of technology in the classroom with students.

- ***Learning ICT through self-study***

The integration of ICT into the teaching and learning practice of academics without doubt demands the acquisition of new ICT and pedagogical skills. The majority of the academics in this study reported that they had undertaken some kind of ICT training through their own initiative. The findings indicate that the academics were primarily interested in developing their ICT skills, including the use of word processing programs, presentation programs and internet usage, among others. The academics argued that many of the ICT skills that were evident in their practice were self-taught and that these skills had been acquired by trial and error using online tutorials and computer-based training (CBT) 'nuggets'. These academics were keen to learn about technologies that they could use in their practice.

This investigation supported research findings indicating that educators should acquire knowledge and self-efficacy if they are to deliver learning that empowers students to create associated knowledge that is relevant to real-life situations. Ertmer (2005) explains that educators who develop personal mastery and learn from their personal experiences increase their self-efficacy. The results of this study reveal that some of the academics were motivated to learn new ICT skills for use in their pedagogy, which reinforced their ability to build mastery in the use of ICT tools (such as presentation programs) and also to increase their self-efficacy.

These findings are in line with Bandura's (1997) Social Cognitive Theory where self-efficacy beliefs are considered to play a significant role in the self-regulation of motivation and where one's thought patterns can enhance or undermine performance. This study's findings indicate that some academics' self-taught skills increased due to successful experiences with social networking tools such as Facebook Live. The academics became more confident through the continued integration of social networking tools into their teaching and learning practices and this resulted in the regular use of these ICT tools. Bandura (1997) argues that an increase in self-efficacy might be achieved through successful experiences with the use of ICT tools. Self-efficacy is premised on believing in what a person can undertake with the knowledge and skills that they already possess.

- ***Systemic training and support***

The academics in this investigation reported that there were ICT training opportunities such as institutional ICT training workshops and short courses in instructional technology that offered basic lessons in the use of the available ICT tools. However, the academics indicated that the training sessions were not tailored to support their pedagogical needs and that the training sessions would primarily emphasise content delivery and nothing else. There were no specialised training programmes or opportunities available to them related to how they could integrate ICT into their teaching and learning practice. These study findings are similar to those of Han, Eom and Shin (2013), who posit that one of the greatest inhibitors that academics face in integrating ICT into their pedagogical practice is the lack of effective professional development and ICT training that would allow them to design and develop a context-specific curriculum that incorporates ICT. These findings were also evident in a study conducted by Karaseva, Siibak and Pruulmann-Vengerfeldt (2015), who report that appropriate training may help academics overcome qualms concerning their beliefs about instructional technologies.

The findings of this study are also consistent with those of Czerniewicz and Brown (2009), who cite the lack of training as an inhibitor to technology espousal in South African universities. Agbonlahor's (2006) findings point to the lack of training as having an influence on attitudes, desires and the ability to integrate ICT into the university classroom. Similarly, Georgina and Hosford (2009), Sife et al. (2007) argue that it is important for institutions to conduct training workshops for instructors, not only as a means of improving their ICT skills but also as a way of getting them involved in the ICT integration process for teaching and learning. The results of this study indicate that, even though there were attempts made by the

university to organise periodical training sessions for the academics in basic ICT skills, they were poorly organised and did not address many of the specific skill needs and challenges that the academics faced in their teaching and learning practices.

The study findings show that some of the participants in this study were reluctant to learn new ICT skills if they perceived it to be of limited use in their teaching practice. For example, some of the academics were not keen on learning how the LMS could be used in their course delivery because they believed that they had alternative approaches (such as webmail and social networking tools).

5.4.3 Perceived challenges in ICT

The academics' views with regard to the use and application of ICT in their pedagogical practice is considered as an ongoing motivation for the advancement of ICT and teaching and learning styles. Even though the majority of the academics yearned to use more technology in their pedagogical practice, it is evident from the study findings that the integration of ICT into their practice was plagued by numerous contextual challenges.

The many impediments to ICT integration were: access to essential ICT, appropriate infrastructure, non-existent technical support services, the negative beliefs and attitudes of some of the academics, and the absence of a clearly defined ICT policy. These issues were reported by the academics as factors that inhibited the successful integration of ICT.

- ***Access to ICT for teaching and learning***

This study's findings show that academics' enthusiasm to integrate ICT into teaching and learning was inhibited by the limited access to essential ICT resources. The majority of the academics in this study indicated that the absence of basic ICT equipment, such as data projectors, laptops and public-address systems, among others, played a significant role in the academics' reluctance to use ICT in their pedagogical practice. The findings of this study show that classrooms were not equipped with the essential technological hardware such as projectors, which made it practically impossible for some of the academics to use digital presentations in their lectures. This may also explain why some of the academics were not enthusiastic about training on how to use ICT as they did not have the ICT tools to apply their training skills. Tusubira et al. (2007) also indicate that the inadequacy of ICT equipment is an inhibitor to the effort of institutions to adopt ICT for instruction. A lack of access to ICT resources places

limitations on academics with regard to the integration of ICT into their practices (Mumtaz, 2000b; Shaikh & Khoja, 2011). Odabasi (2000) reports that a lack of access to ICT was the most significant barrier for faculty members in Turkish universities.

- ***Infrastructure and technical support***

The participants in this study were also concerned that the internet connectivity infrastructure covered some sectors of the university campus, but not the entire campus. The academics thus had to rely on their own internet modems for connectivity, and it was particularly important to have internet connectivity at home since some of their tasks, such as lesson preparation, were completed while at home. The inadequate computer network system and poor bandwidth compounded the negative experiences of the academics with regard to ICT integration. The academics indicated that the incessant power outages limited their use of ICT and sometimes made it impossible for them to conduct computer-mediated classes. Thus, the academics were also burdened with having to prepare alternative lessons as a backup strategy when planning to use ICT in their classroom practice mainly because of the huge inherent issues such as the unreliable power supply. This study's findings echo challenges that are prevalent in many developing African countries (Gakio, 2006). Gakio (2006) contextualises the state of internet connectivity in Africa's higher education institutions as "too little, too expensive and poorly managed; as a result internet technology becomes even less useful for research and education purposes" (p. 41).

The academics in this study reported that they lacked the technical support to integrate ICT into their teaching. More specifically, the academics needed support when they were not able to upload course material on the LMS (Moodle) by themselves. The academics also complained about the frequent software glitches and hardware breakdowns of their equipment, which they attributed to poor maintenance. The academics believed that the provision of ICT technical support would enhance their ability to integrate ICT into their teaching practice. This challenge is not unique to Kusoma University because it has been reported in other studies, such as that of Yang (2009). Yang (2009) also posits that the lack of technical support for faculty is among the most significant challenges in the successful integration of ICT by faculty. Sife et al. (2007) assert that the lack of technical support is typical in many developing countries because there are few ICT experts, thus the burden is on academics to have some basic troubleshooting skills to overcome technical issues when integrating ICT. The absence of technical support was also

raised as an inhibitor to ICT integration in pedagogical practice in various studies (Bingimlas, 2009b; Ertmer, 2005; Karmila, 2013; Kwabena, 2008).

- ***Resistance to change***

Numerous factors contributed to the participants in this study resisting the use of technology in their teaching practice. Firstly, some of the participants in this study expressed concern that the preparation of electronic course material, such as PowerPoint presentations, required a considerable amount of preparation time. They argued that this was challenging given that they had a number of other competing demands that were equally important. Secondly, the participants were also concerned about the steep learning curve that was associated with the use of some ICT tools. All of these factors seem to indicate that these academics were not prepared to take on the extra burden that came with the integration of ICT into their practice and therefore opted to maintain their conservative teaching approaches. The participants made very limited use of the LMS because they felt it was too slow and uploading course content sometimes took ‘forever’, and was not worth the effort. This finding is supported by Sahin and Thompson (2006) and Rogers (2004), who aver that the implementation of a new innovation such as an LMS requires considerable preparation time for users to embrace it, and that the end users must be convinced of the benefits that will be gained from its use for mindsets to change. Ertmer, Ottenbreit-Leftwich and Tondeur (2014) add to the debate that learning and developing the skills necessary for ICT integration takes time, and that the lack of time is a barrier to the integration of ICT by educators.

The academics argued that tools such as the LMS software were not user-friendly and that they were required to spend long hours exploring the technology before they could use it. The findings of this investigation also show that some of the academics believed that some Web 2.0 technologies were difficult to use. This finding lends credence to similar results by Govender and Dhurup (2014), who detail that users declined the use of LMS because they found it time consuming and sluggish and, as a result, they became frustrated. Therefore, the reluctance of academics to integrate ICT into their pedagogy may be due to their own beliefs that ICT tools, and especially Web 2.0 technologies, are difficult to use.

- ***Institutional ICT policy and supporting guidelines***

In terms of policy challenges, the findings of this study reveal that Kusoma University lacked a clear documented ICT policy to guide academics in their teaching and learning practice.

Though the university's strategic plan for the period (2008-2017) mentioned an ICT policy, it is evident from the reviewed documents that Kusoma University lacks an ICT policy mandate. The academics indicated that they had no knowledge of any ICT policy document at the university. More significantly, the Government of Uganda also lacked a comprehensive ICT policy to direct HEIs' institutional practice.

The absence of a comprehensive documented ICT policy was perceived by the academics as a lack of commitment by the university administration and national leaders. They were of the opinion that the absence of an ICT policy was an indication of the lack of commitment by university leaders to adopt ICT. The academics highlighted the need for an ICT or e-learning policy, given that the university was positioning itself through rhetoric as an ICT-driven institution. The findings of this study echo those of Wozney, Venkatesh and Abrami (2006), who argue that the lack of or failure to communicate a systematic policy and its associated strategy would inhibit ICT integration.

5.4.4 Perceived opportunities in ICT

- ***The will to change***

These study findings show that the beliefs, perceptions and attitudes of the majority of the academics towards the integration of ICT into teaching practices were positive. The academics were increasingly cognisant of the wealth of educational resources that were available whenever ICT was used. The academics believed that the use of ICT in their pedagogy afforded them the opportunity to access new and relevant course material that they could use to enrich their instruction. Through the use of ICT, the academics were able to augment their course content with current material from the internet for the benefit of their learners. This finding is reaffirmed by Karaseva et al. (2015) and Holden and Rada (2011), who concluded that academics are more likely to integrate ICT into their teaching and learning practice if they demonstrate positive attitudes towards ICT integration and if they have high levels of self-confidence in relation to ICT usage.

The study findings reveal that by integrating ICT, academics' interest was premised on creative avenues that would enable them to interact with students more frequently. Their intention was to improve the quality of their class interactions through the use of presentation slides that were structured to keep discussions on point. Similarly, the accounts of the majority of the academics regarding the use of technologies like PowerPoint and the LMS in the presentation and storage

of course material reflected their resolve to introduce new course material that would perfectly elucidate concepts in their courses.

This study has highlighted that the majority of the academics made use of ICT tools in their teaching practice if they believed that using these tools would help them to enhance their teaching and learning practices. These results are supported by the findings of Raphael and Mtebe (2017), who find that educators are bound to use technology if they perceive that the outcomes of the integration of ICT into their activities will result in positive outcomes.

Although the academics in this study joined Kusoma University with different levels of experiences, goals and understanding, they had the will to explore the incorporation of technology in their practice to advance in their work and also to benefit their students. From the interactions with the academics on how ICT made their work easier, their positive position can be seen in their choice of words: “it saves time”, “it reduces the workload”, “it helps in students’ coursework record management” and other similar assertions. This is, in fact, synonymous with “efficiency”, a catchphrase in the contemporary university (Fairfield, 2016). Even though the integration of ICT into academic practice requires substantial effort, time and personal expense, the majority of the academics in this study were encouraged by the new possibilities that ICT brought to their teaching practice. The academics attached a substantial amount of importance to the integration of ICT into their academic practice, which motivated them to be resilient in the constrained context in which they found themselves.

- ***Enhancing 21st century skills***

The academics in this study indicated that ICT was important in developing learners for the 21st century. Some of the academics argued that the 21st century called for self-directed learners with higher mental skills coupled with information systems literacy to face the indispensable requisites of the knowledge era, and to be abled citizens. The majority of the academics indicated that looking through an educational lens, ICT was instrumental in the promotion of interaction, the speedy delivery of course material and knowledge-sharing. They also mentioned that it was key to providing the kinds of hands-on experience necessary for optimising knowledge construction, collaboration, as well as the development of critical thinking skills that are necessary in the 21st century. These findings are also consistent with those of Shin, Sutherland, Norris and Soloway (2012), who posit that ICT promotes interaction, knowledge-sharing and collaboration, all of which are significant for the enhancement of 21st century skills, which are deemed important for students to succeed inside and outside of the

classroom. Pheeraphan (2013) argues that the integration of ICT in classroom practice by academics could enhance 21st century learning skills significantly at both undergraduate and graduate levels.

Drawing from the findings of this study, the academics were eager to equip learners with 21st century skills and they viewed ICT as a means to foster communication, collaboration, research, and critical thinking. The majority of the academics demonstrated this by encouraging and guiding their students on the use of social networking technologies to collaborate and communicate amongst themselves. The academics indicated that once the students were allowed and encouraged to dialogue using social media, they would be able to enhance their communication and collaboration skills, which are considered as essential for students in the workplace. Some of the academics believed that allowing students to engage in ICT-mediated discussions would enable them to improve the quality of their arguments, which not only made them better communicators, but also enhanced learning.

- *The ubiquity of ICT*

The findings of this study show that the university was in the process of making ICT more accessible for teaching and learning. Facilities such as the digital learning centre had been established, and efforts were being made to ensure that the LMS was accessible to all academics and students for use in instruction. The majority of the academics in this investigation indicated that the failure of the institution to provide internet connectivity all over the campus was further compounded by a lack of internet access off-campus. However, this did not deter them from finding alternate means to access online web resources. The academics acquired private internet modems that allowed them to communicate with their students anywhere and at any time. Gumpert and Chun (1999, p. 9) explain that “technology innovations were so pervasive in that higher education was not insulated from these innovations. They have the potential to transcend previously assumed constraints of time, place and participants in the process.”

The majority of the academics in this study used their personal internet connectivity tools to foster the pervasiveness of ICT. Some of the academics indicated that social networking tools like Facebook and WhatsApp were readily available on many of the connected devices, especially smart phones. These widespread technologies afforded them an opportunity to transform their teaching practices and to do so in thoughtful ways. They reported on the convenience of Facebook as a learning management system that was used to conduct online

class discussions and live broadcasts wherever and whenever they found it convenient. The findings of this study show that ICT was not pervasive given that the institution's network infrastructure and internet connectivity covered only some areas of the campus. The study also reveals that the participants had to rely on personally owned internet connectivity devices like modems if they wanted to stay in touch with their students online. Siemens and Tittenberger (2009) also aver that emerging technologies like Web 2.0 tools offer academics and students additional opportunities to increase engagement with one another in limitless ways through personal learning environments and networks. Siemens and Matheos (2012) posit that technology has become pervasive in universities. The electronic submission of assignments, online library materials, wireless access, and LMSs are all manifestations of its presence. These technologies allow academics to teach the same way as in the past, but this time with greater flexibility. The use of private internet modems by the participants in this study expanded their connectivity reach, allowing them to maintain open communication lines with their students.

The majority of the academics in this study reported that the wireless internet access points on campus made it possible for them to quickly access online resources that they would use to supplement their course material. They argued that this had been quite impossible before the advent of technology, and that the increased investment in network infrastructure would ensure their access to these resources anytime, anywhere. Some of the academics in this investigation indicated that they had begun to use personal mobile technologies (such as smart phones) in areas that were not covered by the institution's network, especially off-campus to access online resources and interact with their students ubiquitously. Benson and Morgan (2013) assert that the proliferation of innovative technologies, such as smart mobile devices and higher bandwidth internet connectivity, have had a significant impact on HEIs. In this respect, better connectivity (more so wireless) has led to an increased number of academics and students accessing learning platforms through their smart phones and being able to work on course material instead of paper notes, and participate in discussion forums on their mobile gadgets.

5.5 Differences to the extant literature

Disparities between the existing literature and the current study's findings were discovered. This section highlights the issues under the different themes in this study that were found to be in contrast to the findings of previous studies.

5.5.1 Current pedagogical practices

- *A shift to Web 2.0 technologies for teaching and learning*

Prescott's (2014) study showed that the majority of the faculty members did not want to make use of Facebook for educational purposes in their courses. The academics in one of the universities in the UK argued that social networking sites such as Facebook presented new legal, ethical and professional challenges for academics as well as students. Prescott's (2014) study revealed that the participants were concerned about who should be accountable for unprofessional behaviour online as well as online and offline identities. Some of the participants were of the opinion that both faculty and students ought to be accountable for their unprofessional behaviour online and that the implications of their unprofessional behaviour online should be communicated to them. Browning, Gerlich and Westermann (2011) aver that social media had not been embraced by academics as an instruction tool partly because academics are not aware of the opportunities that exist to leverage the power of social media in teaching. Shelton (2013) posits that social networking tools were among the least used technologies in teaching and learning because lecturers did not view these technologies as having an impact on their teaching and that the lecturers also lacked the confidence to use these tools in practice. Shelton (2013) described technologies such as blogs as marginal technologies because they were used much less frequently by university lecturers in comparison to technologies such as PowerPoint, which he described as core technologies because of their frequent use, even when lecturers did not think that they were adding value to the learning process.

In the current study, the findings are contrary to the literature evidence as the academics at Kusoma University were eager to make use of social networking tools such as Facebook, blogs and WhatsApp for instructional purposes. Through the use of Web 2.0 technologies, the academics in this study were able to connect with their students beyond the confines of the classroom walls, a practice that scaffolded learning. The academics realised that many of their students were more comfortable with Facebook and that they logged into their Facebook accounts as a preference to the LMS system. As such, the lecturers found it easier to use the Facebook tool since it bridged the communication gap between them and the students. This seems to suggest their preference for social media tools over the institution's LMS. The academics noted that their students owned smart phones, which made it much easier for them to use social networking tools for communication and collaboration. The students' preference

for Facebook and WhatsApp emanated from the fact that students were already comfortable with these tools since they were already using them for social interaction and communication.

5.5.2 ICT paradigm shift: Changes in teaching practice

- *An evolving pedagogical role*

On the one hand, Karsenti and Fievez (2013) argue that academics integrate ICT as a means of delivering digital content to their learners and not as a way of enhancing learner-centred approaches. The findings of this study, on the other hand, indicate that the academics were using ICT to promote learner-centred approaches that encouraged students to actively participate in both online and physical classroom activities. The majority of the academics in this study employed teaching approaches that required students to make presentations on particular subject areas during the face-to-face classroom session. This meant that students took a keen interest in their learning since they were evaluated on how well they executed particular assessment tasks. The students actively engaged in discussions that were moderated by the academics, and also worked on assignments either as a group or as individuals. Web 2.0 technologies, in particular Facebook, created an opportunity for students' collaborative activity through the online forums in which the lecturer adopted the role of a facilitator.

This study reveals that some of the academics who adopted student-centred approaches to teaching felt comfortable with the shift from a lecture-centred role in the classroom to an online facilitator's role, even though they had less control. This finding contradicts that of Montrieux et al. (2015), whose study on the use of mobile technologies in teaching and learning indicated that educators experienced 'lack of control' issues when faced with a shift from being the drivers of the teaching and learning process to being online facilitators. Montrieux et al. (2015) also found that instructors were prompted to become more conservative in behaviour as they claimed that the shift would alter their central role in the distribution of knowledge and that the students may be distracted by technologies such as the internet, among others.

The majority of the academics in this study firmly believed that ICT usage in their practice gave them the opportunity to enhance their course material (for example, the use of YouTube videos to enhance concept explanation), thus conforming to their learners' needs. The findings show that academics were keen on integrating ICT using approaches that supplemented their existing teaching and learning designs. The findings of this investigation contrast with the findings of Becher and Trowler (2001), who find that academics resist change (from

conventional teaching practices to ICT-mediated approaches) owing to their varying subject beliefs and attitudes.

- ***Perception of changing student attitudes***

The integration of ICT into teaching and learning created greater subject appeal, hence inspiring students to actively engage in more independent learning. The academics argued that ICT created avenues where they were no longer required to prepare and avail students with all of the necessary course material physically since they were in a position to access online resources (internet resources) in addition to course material that was uploaded to the institution's LMS. Some of the academics indicated that students who missed classes for various reasons were able to access the online course content and were thus not disadvantaged. Significantly, the academics made supplementary course material information available online, which exposed students to additional illustrations or explanations which they believed enhanced students' understanding. This practice indicates that the academics were facilitating learning by acting as conduits to additional online resources, and at the same time empowering independent study. They were also confident that this strategy of teaching enhanced the credibility of the course material given by the academics since students would use other resources online to fact check some of the material. In contrast, Oliver (2002) found that ICT integration in higher education that lends itself to a student-centred approach may create tension in situations where academics want to be in total control of the teaching and learning process, whilst students are demanding some level of independence.

It was evident in this study that students were more eager to participate and were effectively contributing to online discussions as opposed to the face-to-face classroom context. Furthermore, the participants were seemingly convinced that the social network environment created an opportunity for students to critically engage with the subject content, thus enhancing their thinking. These findings are in stark contrast to those of Khine and Fisher (2003), who argue that the use of ICT may lead young students to become more introverted, more inactive and less able to think.

5.6 Silences in the findings of this study and those of other studies

The review of extant literature reveals that there are findings in previous empirical studies that did not emerge in the current study. Furthermore, findings also emerged from the current study that are not evident in the existing literature that was reviewed. Significantly, I present my

findings that are evident in the current study but absent in the extant literature as new knowledge that is grounded in this study. This section describes the silences in my study and those in the literature.

5.6.1 Silences in my study

- ***ICT for student grading***

The current study did not find any evidence that academics used ICT in their teaching and learning practice for assessment. However, the literature abounds with evidence that academics have been using computerised grading for many years now (Cody, 2014; Strauss, 2013; Winterhalter, 2013). The academics in this study seemed to be focused on the use of ICT to enhance teaching through better course content delivery approaches and interaction with their students. Furthermore, they made no attempt to use the LMS's assessment features in the evaluation of students' performance.

Although this study revealed that the academics were using multimedia content such as videos in their practice, it did not find evidence of academics creating their own videos or (podcasts) as a way of emphasising the most important aspects of their lessons. These academics instead sought to download videos from sources like YouTube. There is evidence in the extant literature that academics who wish to enrich their course material and scaffold learning create podcasts of their lessons that draw out the important aspects from previous class interactions that might not have been obvious to the students (Richardson, 2010; Shelton, 2013; Siemens & Matheos, 2012; Venkatesh, Croteau & Rabah, 2014).

5.6.2 Silences in the extant literature

In this study, the academics were exploring new approaches to teaching and learning using social media to deliver their subject content. This strategy of teaching allowed for engaged interactions with learners and provided instantaneous feedback beyond the confines of the classroom walls. While some of the academics admitted that they previously used social media for personal reasons, some of them admitted that they were increasingly using social networking technologies for academic purposes. In this study, it is evident that some of the academics used Facebook and Blogs as a means of teaching, which was consistent with the extant literature (Greenhow & Lewin, 2016; Lytras et al., 2014; Thomas & Thomas, 2012). However, a few academics made a significant transition to using Facebook Live as a social media tool to enhance their teaching practice,

These academics were innovatively conducting real-time teaching and discussions through Facebook Live's video streaming feature. This synchronous approach to content delivery and classroom engagement allowed the students to join the streaming video sessions wherever they were as long as they had internet connectivity. This study shows that a small pocket of academics were employing innovative practices, such as use of social media, not only to deliver course content, but also to actively engage their learners in the construction of knowledge.

The shift to the use of social media was due to the attractiveness of social media as a more viable means of online teaching, which I consider as 'pull factors'. The academics in this study opted to move away from the institutional LMS and adopted social networking technologies as an alternative method of course delivery. They attributed this transition to open social networking web-based systems (such as Facebook Live, Blogs and WhatsApp) as a more user-friendly online teaching-learning system. The use of social media also had other benefits such as being stable, free of charge, not reliant on the universities' power supply, easily accessible by students, and it seemed to be a technology of choice for most students. As such, the participants in this study preferred to use social media networking technologies (such as Facebook and WhatsApp) because of their simplicity, relative advantage and convenience. Loketo indicated that he opted for Web 2.0 technologies because they were much easier to deal with in comparison to the LMS.

The shift to the use of social media was also due to contextual challenges that existed at Kusoma University, which I consider as 'push factors'. Firstly, there was the prevailing issue of unstable and irregular power supply. Secondly, there was inadequate ICT access on campus, and parts of the campus were without any local network connectivity. Thirdly, the use of the existing LMS was limited to the delivery of digital content (handouts and course outlines). Fourthly, the use of LMS was associated with a steep learning curve for the participants, Loketo, for example, felt that this steep learning curve only served to discourage potential users. He was concerned that the time invested in accomplishing a task on the LMS was excessive and he was not willing to endure this waste of his time. His poor experience with the LMS platform compelled him to work with alternative means to communication, such as Facebook, WhatsApp and blogs to communicate with his students.

The extant literature seems to be silent on the use of social media in higher education as a means of live streaming lectures. In contrast to some of the existing literature (Browning et al., 2011; Prescott, 2014), which suggests that academics do not wish to use social media for

teaching and learning, and in cases where they do (Menkhoff et al., 2015; Mutula, 2013; Thomas & Thomas, 2012), it is used in a limited context for communication, sharing of electronic resources and to engage in interactive discussions. The extant literature (Condie & Livingston, 2007; Kirkwood, 2009; Makrakis, 2005; Saunders & Klemming, 2003) on the use of ICT in teaching and learning reveals the conventional ways of teaching using technologies such as overhead projectors, data projectors and the like. The literature reveals that academics are simply interested in the delivery of course content and are less concerned about actively engaging learners as part of teaching that allows them to develop their critical thinking abilities.

This study's finding adds a new dimension to teaching at a resource-constrained higher education institution, namely, that academics use social media streaming features to conduct their teaching in real time. The use of Facebook Live is an indication of the academics' desire to find new and convenient approaches to teaching and learning. This study finding pushes the boundaries in this field of study by providing deep and meaningful insight into academics' use and perceptions of the use of social media for teaching and learning.

The study also extends the debate on the resilience of academics in making use of ICT in their teaching practice in difficult contexts. This study highlights the resilience of academics in the integration of ICT in their teaching repertoire, even though they may operate in a resource-constrained environment. Their determination to make use of ICT was attributed to their willingness to change from traditional teaching practices to more modern approaches to teaching and learning that conform to 21st century skills. The extant literature is silent on academics' perseverance in resource-constrained contexts.

The literature on the integration of ICT in teaching and learning reveals that academics, especially in resource-constrained countries, are quick to give up on the adoption (Gaffar et al., 2011; Kwabena Ayeh, 2008; Nyirongo, 2009; Tusubira et al., 2007) of ICT in their practice because of the unfavourable conditions that are usually exhibited, usually in the form of low bandwidth connectivity and power outages, among others. This study reveals that academics in a resource-constrained environment were more determined than ever to embrace ICT usage in their teaching practice. It would seem that their resilience to use the existing technology to its full capacity stems from their apparent beliefs and attitudes about the importance of ICT in developing 21st century learners. The academics that persevered with the available technology are of the opinion that teaching and learning in the future will be largely mediated by

technology given that it affords both academics and students the flexibility to teach and learn from anywhere, at any time.

5.7 Theorising the Findings

This study explored how academics at Kusoma University in Uganda were integrating ICT into their teaching practice. Furthermore, the researcher attempted to understand their perceptions and beliefs regarding the use of ICT and how it influenced the educational purpose of their teaching. In this regard, Rogers' (2003) Diffusion of Innovation Model was used as the theoretical framework that underpinned this study.

Rogers (2003) defines an innovation as “an idea, practice, or object that is perceived as new by an individual” (p. 12). According to Rogers (2003), technology is sometimes used synonymously with an innovation, which he defines as “a design for instrumental action that reduces the uncertainty in the cause-effect relationships involved in achieving a desired outcome” (p. 13). Using Rogers's Diffusion of Innovation (DoI) Theory, a prospective user of a new innovation would have to perceive the innovation as superior in terms of benefits to an existing one. According to Rogers (2003), the timing of one's adoption decision is assumed to be determined by the subjective perception of a set of product features. This study examined the spread of new innovations (ICT) by considering Rogers' (2003) five qualities of an innovation from the perspective of the academics as innovators, these included: relative advantage; compatibility; complexity; trialability; and observability.

Relative advantage

Relative advantage is defined by Rogers (2003) as “the degree to which an innovation is perceived as being better than the idea it supersedes” (p. 229). The academics argued that social networking sites like Facebook and Facebook Live offered a quantum leap in communication and interactivity with their students as opposed to the institutional LMS. Their demand for faster and constant communication with their students required that the academics adopted better technologies that supported interactive dialogue. Facebook, WhatsApp, and blogs were the information and communication technology of choice. These technologies provided a better alternative to the LMS given that these were readily accessible through the World Wide Web both on and off campus, which was not the case with the institutional LMS. The academics argued that Web 2.0 technologies were already popular among the student community and that their use was frequent and widespread. As such, it did not take a lot of convincing for the

students to use them for purposes of learning. The social media technologies were adopted by the academics as a means of reinforcing ‘a sense of belonging’ in online communities, thereby fostering collaboration and knowledge co-construction. This transition to online social media presents better alternatives to the LMS and other traditional teaching approaches that characterised their previous practice.

The academics in this study viewed the use of traditional media such as PowerPoint as restrictive in terms of interaction. They argued that its use supported one-way communication, which did not promote the 21st century skills of interactive communication and collaboration. Social networking tools, alternatively, were viewed as delivering a superior learning experience by facilitating a two-way conversation that encouraged contributions and feedback from everyone who was part of the dialogue, thus blurring the lines between media and audience. The participants in this study seemed to suggest that the traditional media, together with the learning management system lacked the personal touch and networking capacity that was present in Web 2.0 tools such as Facebook and WhatsApp. They considered tools such as Facebook to offer a better option for teaching since these combine features such as chat groups, text and image, sound and video sharing to promote an online community that extends learning beyond the confines of the classroom. The academics in this study viewed social media technologies as enhancing group and creative learning on the one hand, but also ensuring flexibility for use in self-centred student learning on the other hand.

The results of this study reveal that the participants were capable of using Web 2.0 tools for teaching and learning purposes. The functionalities of tools like Facebook, WhatsApp and blogs were diverse in terms of creativity, collaboration, entertainment, visualisation and networking. The interactive features of the Web 2.0 tools gave a new dimension to on- and off-campus learning, which was absent from applications like PowerPoint and platforms like the LMS. The use of Facebook Live for teaching and learning had a relative advantage as the academics could deliver real-time lessons in better and convenient ways. There was a possibility for virtual excursions, videos, audio files and pictures in order to make online lessons more attractive to students and to motivate them to participate more actively. The academics also indicated that the conversations on these platforms could easily be accessed without place and time restrictions. In contrast, the digital content that was uploaded on the institutional LMS was subject to time restrictions, which meant that the students could not

access this material after a specified period. This corroborates what Rogers (2003) terms as the relative advantage of an innovation that makes it more appealing to use than what it replaces.

Whilst the majority of the academics acknowledged the relative advantages that were associated with the use of ICT in their teaching practice, some of the academics were not eager to incorporate some of the technologies (such as the LMS) into their practice. These academics' preference for the traditional approaches to teaching were affirmed during the interviews and also observed in their class sessions. Some of the academics believed that they were better off dealing with the traditional face-to-face teaching approaches that did not require the incorporation of ICT since they were content with these.

Compatibility

Rogers (2003) posits that "compatibility is the degree to which an innovation is perceived as consistent with the existing values, past experiences, and the needs of potential adopters" (p. 15). Compatibility was the second attribute that was examined in this study. The process of adopting an innovation can be accelerated when the individual feels that the innovation is compatible with their needs and experiences. This investigation revealed that the use of Web 2.0 tools were viewed by the academics as compatible with their needs, past experiences and existing values. The majority of the academics in this study favoured a high degree of interaction in and outside of the classroom, as such they viewed Web 2.0 technologies as compatible with their need to enhance their interaction with other academics and students in the form of collaborations and communication. The participants felt that social media technologies were powerful and credible tools because of their beneficial qualities, which include peer feedback, interaction features and goodness of fit within the social context.

This study revealed that the academics viewed the use of social networking technologies, such as Facebook, as compatible with their need to promote the 21st century skills of critical thinking, collaboration and communication among their students. The academics believed that collaborative learning, which also relates well to the constructivism approach to learning, would encourage their students to work together to solve problems, or discuss ideas, or even acquire new knowledge. Some of the academics in this study created a 21st century context for learning by bringing the world into their classroom through rich multimedia content like YouTube videos and web excursions. These practices by the academics created opportunities for students to collaboratively interact with one another. The participants argued that the use of Web 2.0 technologies allowed their students to work with cognitive systems where

knowledge was distributed across different nodes. The academics guided and directed students to access particular valuable course resources (as was the case with Makyati referring his students to professional body websites for course material) towards educational competencies and outcomes.

The participants in this study noted that a switch from focusing on technologies that promoted course content coverage (such as the LMS or PowerPoint) to technologies that supported interaction and engagement was a major paradigm shift for both academics and students. The participants believed that the use of social media tools was consistent with their teaching philosophy of employing active learning strategies. The academics' practices favoured technologies that accommodated different learners. As technology became more ubiquitous, academics who experienced less success with tried ICT tools like the LMS were more likely to try out other technologies (such as Web 2.0 tools) provided that potential relative value could be demonstrated. Digital technologies such as Facebook, blogs and WhatsApp were appreciated by the academics for their role in transforming traditional classes into interactive ones. This change was compatible with the academics' need to actively engage their students in the co-construction of knowledge. The students thus played a leading role in the discussions and the academics acted as guides and facilitators. The academics were attracted to the use of Web 2.0 tools because they associated these with the promise of enriched student learning. Proprietary software such as Microsoft PowerPoint and the LMS were also viewed as reinforcing and enhancing a diverse suite of constructivist pedagogies. The academics embedded YouTube videos in their presentation slides to scaffold learning. This was compatible with the participants' desire to accommodate the different types of learners in their courses.

The practices of the participants in this study were in line with the university's push to become an ICT-driven institution. The participants were encouraged to make use of digital technologies in their classrooms and had to adapt lessons in compatible ways. At the time of this study, the institution was already using a digital platform (Moodle) where academics deposited course material, course outlines and assessment exercises. The academics indicated that students did not have an active role, the platform did not have characteristics of online social media and did not seem user friendly to both students and academics. As such, social media was viewed by the academics as a step forward as it had not only the advantages of the learning management system but also many features that made it more familiar to the students.

This investigation revealed that the academics' past experiences with the use of the LMS were negative and they argued that the LMS did not add value to their teaching practices since academics like Makyati believed that teaching was more than simply delivering course content using platforms like the LMS. The platform's limited features in terms of interactivity with students also brought to the fore the need to experiment with better technologies. The participants viewed Facebook's web application as easier and more instantaneous as compared to the LMS. The academics indicated that the digital student population was more comfortable with the use of Web 2.0 tools given that they were used to being online most of the time, using instant messaging, and being connected wirelessly with friends through various devices like smartphones and other media. As such, some of the participants were reluctant to encourage other users to adopt the LMS due to the difficulties that they had encountered.

Complexity

Rogers (2003) describes complexity as "the degree to which an innovation is perceived as relatively difficult to understand and use" (p. 15). Innovative practices were assessed in light of the level of complexity. The academics in this investigation reported some level of complexity in working with the available ICT tools, while the majority of the academics indicated that tools like the institutional LMS had a steep learning curve and that it was not user friendly. Alternatively, ease of use was one of the strongest points of Web 2.0 technologies like Facebook, blogs and WhatsApp. Even the digital immigrants, academics and students could use them without much challenge. Unlike the institutional LMS, social media like Facebook was familiar to both academics and students. The Web 2.0 tools were freely available online, cloud-based and did not need any installation so long as one had a compatible device and internet connection. Furthermore, these tools were also available in mobile version so that students could have access to the 'digital classroom' on the go (from their smart phones or tablets). Rogers (2003) avers that the higher the level of complexity of an innovation the less likely it will be used and the adoption rate will decrease. As such, excessive complexity of an innovation becomes a major obstacle to its adoption.

In the current study, some of the academics viewed social media tools such as Facebook, blogging tools, and messenger applications such as WhatsApp as less intricate and more relevant to their practice. The academics who reported the use of ICT for personal purposes (for example, research) seemed to be comfortable enough to use ICT in teaching and learning. The academics considered ease of use and knowing that the technology was reliable as

important. The finding that ease of use is of importance to academics is not new. However, it does confirm that ease of use is a factor that cannot be ignored in the innovation adoption process. Venkatesh and Morris (2000) posit that user acceptance is determined by two key beliefs, namely, “Perceived usefulness and perceived ease of use” (p. 116). The aforementioned study was based on Rogers’ (2003) DoI Theory.

Despite the apparent simplicity when initially observed, the participants in this study reported some level of complexity in learning and using presentation software and hardware. The participants indicated that not only was it cumbersome to carry the equipment to their lecture rooms, but there was a considerable time and anxiety involved in the setting up of the data projector. For some of the participants, the presentation software was even more complex for those that were not conversant with PowerPoint. The academics noted that one had to first learn how to use a laptop and then learn the presentation software before embarking on setting up the equipment for use in the classroom. The academics also reflected that in case of equipment failure, there was a heightened risk of embarrassment in front of colleagues or students.

Some of the academics in this study viewed the convergence of the academic and administrative responsibilities for teaching as a complexity that contributed to their reluctance to make use of the institution LMS. They argued that the tool was not user-friendly owing to the fact that it had just been introduced and that they required a considerable amount of time coupled with training to acquaint themselves with its features. The participants preferred ICT tools like Facebook, Blogs and WhatsApp, which were much more user friendly and as such did not want to burden themselves with the LMS.

Trialability

Rogers (2003) defines trialability as “the degree to which an innovation may be experimented with on a limited basis” (p. 16). This study revealed that the majority of the academics had acquired their ICT skills through a trial-and-error approach. The academics stated that they explored social media technologies such as Facebook, blogs and WhatsApp for communication with their students and colleagues and were under no obligation to use these tools. The participants further indicated that it was easy for them to create accounts on social media sites for trial purposes. There was no need to create a discussion group before testing it. However, their students and other academics could be part of the online community, participate in chats, express opinions, exchange ideas and eventually, the academics could prepare how best to create a digital classroom. They argued that the more they explored a particular ICT tool, the

more comfortable they became with its use in their pedagogy. The participants were free to continue or discontinue the use of these technologies if they did not perceive any added benefit to their pedagogy. Thus, Web 2.0 technologies were deemed easy to use without commitment and could be changed or deleted anytime without consequence.

Some of the academics believed that course objectives could not be achieved using the institutional LMS since they did not have the opportunity to experiment with this platform. Alternatively, the participants indicated that they had the opportunity to experiment with social networking tools without place and time restrictions. Their ability to trial Web 2.0 tools motivated them to move away from the institutional LMS whose accessibility was limited mainly to the on-campus environment. Rogers' theory postulates that people form beliefs concerning what they can do or achieve based on planning and motivation and that this can impact the perceived causes of success and failure (Rogers, 2003). Triability is a primary diffusion factor and, as such, it is important that academics are able to experiment with ICT tools for teaching and learning purposes and should have enough opportunity to try the tools when the need arises.

Alternatively, some of the academics in this study did not give much attention to exploring social media tools for teaching. This could be attributed to their unwillingness to use these tools at all and also because they were not keen to trial any technology as they did not foresee any benefits. Another contrasting explanation could be that these academics may not have been comfortable with abandoning the traditional tested teaching approaches in favour of ICT-mediated approaches and hence thought that there was no need to try out new digital web tools.

This study also revealed that not all of the academics had access to ICT resources. For the academics to be able to experiment with ICT, they should have access to ICT resources so that they can have an opportunity to try them out for teaching purposes. The findings of this study seem to suggest that the academics made limited use of ICT tools like data projectors because they lacked access to these tools. This study reveals that there were only a few data projectors compared to the number of users. This may have contributed to the non-use of these tools by academics in their teaching practice. These findings are consistent with Zakaria's (2001) argument that limited computer access results in the inadequate use of ICT by faculty members in their curriculum. Medline (2001) avers that the accessibility of physical ICT resources is a crucial factor that affects faculty members' decision to integrate digital technologies. Sahin and Thompson (2006) reveal that access to ICT resources is a crucial diffusion factor.

Observability

Rogers (2003) defines observability as “the degree to which the results of the innovation are visible to others” (p. 266). Rogers avers that the chances of adoption are usually greater if people can easily observe relative advantages that accrue from the innovative uses of technology. This construct of observability is reflected in the academics’ responses in this investigation. The academics indicated that their students had suggested to them the use of some Web 2.0 technologies having observed their use by other academics in similar courses. The academics indicated that students had reported observing an increase in interaction and student engagement in the form of group discussions in courses where the academics employed tools like Facebook, WhatsApp and blogs. As a result of the observations made by the students, the instructors were encouraged by their students to make use of tools like Facebook Live in their course delivery since they had seen them work elsewhere with other academics. For example, Loketo made use of Facebook Live at the request of his students. The participants in this study believed that social networking technologies had grown in popularity and usage to the extent that academics and students found it difficult not to see an opportunity to integrate social media into their practice. The visibility of tools like Facebook and WhatsApp in this study was very high. Social networking tools are integrated with traditional media and an individual’s social environment, making them very difficult to ignore.

In this study, observability was also explored in the context of digital data projector use and computer use. Although some of the innovations were easy to observe (hardware) and communicate to others, the same cannot be said of innovations that manifested as software. The participants were able to see colleagues make use of tools such as data projectors and laptops in their classroom practice. The academics indicated that they were approached by colleagues seeking to know how they could make use of PowerPoint presentation software and data projectors that they had seen them use. Peer observation was a key motivational factor in this study, especially where academics were paired to teach on the same course as part of team teaching. This involved senior academics (senior in terms of experience) mentoring juniors on the job. The participants also indicated that they had heard from colleagues and friends about these technologies and how they were being deployed for teaching. This finding is similar to what Mannan and Nordin (2014) termed as role modelling. They argue that role modelling significantly influences the adoption and diffusion of ICT.

Alternatively, there was a group of participants that were aware of the innovative practices of the academics but did not make a shift to using ICT tools like blogs. Musomesa was one of those that indicated that he had heard of academics' use of blogging tools for teaching and learning but did not explore their use in his own teaching and learning. This may be because he had not observed any tangible benefits accruing from the use of these tools.

In summary, this study found that all of the five attributes were evident in this investigation, some to a greater extent than others. The most significant attribute was that of relative advantage, which was the most influential. Rogers (2003) finds that innovations offering more relative advantage, compatibility, simplicity, trialability and observability will be adopted faster than other innovations. This is true for Web 2.0 tools in the present investigation, since the academics viewed them as delivering a superior learning experience in comparison to the LMS and proprietary applications. Rogers does, however, caution that "getting a new idea adopted, even when it has obvious advantages, is difficult" (p. 1). This is also evident in the current study's findings as the academics experienced various inhibitors in their relentless pursuit to integrate ICT into their teaching practices. The resilience of the participants in this study points to their cognisance of the opportunities that ICT creates for teaching and learning. The availability of all these innovation attributes tends to speed up the innovation-diffusion process. The academics in this investigation had positive attitudes towards these attributes. Jacobsen (2000) posits that for a technological innovation to be successfully diffused among faculties, it is important that it is perceived as useful and consistent with their beliefs and that they should not view ICT as complex tools for pedagogical use.

5.8 Conclusion

The analysis and discussion of the academics' perspectives on the integration of ICT into their practice converge to offer a better understanding of why and how these academics integrated ICT in their pedagogical practice and the contextual issues that surrounded the adoption of technology in their teaching. Through the analysis, links were made to some salient issues identified in previous research studies, but this study's context differs and reveals new insights into how academics are integrating ICT into their practice.

Firstly, participants in this study had deeply considered views about the integration of ICT into their pedagogy and how this technology enriched or enhanced student learning. The reluctance of some academics to adopt ICT reflects their efforts to discern how best to integrate ICT into

their old teaching practices. The participants mainly used ICT to enrich course content, as well as to enhance their pedagogy. Their old practices relied on simultaneous access by all students to blackboards, whiteboards, overhead projectors and other physical resources like textbooks. Hence, when ICT was simply substituted for these technologies, the results seemed to be unsatisfying for academics as well as students because of the limited accessibility and the varying functionality of ICT. These contextual factors suggest that academics need support to develop innovative approaches to teaching, and greater access to reliable technology before the powerful ICT learning environment can be realised. Despite the inhibitors associated with ICT integration in teaching, the participants were generally of the opinion that ICT offered excellent tools to both the academics and students, and that its contribution to the education process was positive.

Secondly, the academics were cognisant of their changing pedagogical roles and viewed ICT as a tool that would significantly help them as they embraced their new role as facilitators, problem solvers, knowledge experts, effective listeners, collaborators and resource coordinators. As academics, they were supposed to know where to find relevant information to guide learning. The 21st century demands that academics should be technologically orientated and responsible not only for their teaching but also for their students' learning. Instructors are obliged to be facilitators, assisting students to make decisions regarding the validity and quality of new sources and knowledge, be open-minded and critical independent professionals, be active collaborators and mediators between learners and what they need to know, and able to scaffold understanding (Amin, 2016).

Thirdly, this study extends the body of literature in the field of ICT integration for teaching and learning in a developing country context. The results of this study indicate that Facebook can be used to supplement or even a substitute for an institution's LMS. The practicality and availability of this Web 2.0 tool allowed for instantaneous communication, collaboration and delivery of electronic material, which was not possible in the academics' previous practice. More significantly, Facebook Live was revealed as an innovative practice that was being used by academics to conduct online classes and discussions. Facebook Live was viewed by the participants as flexible, instantaneous and as having the ability to accommodate multimedia. The integration of social networking technologies by the academics offered academics and learners the flexibility and ability to create learning communities, and revisit content on demand. Teaching and learning should be engaging, interactive and course material

should motivate students to learn through challenging pedagogy and learning style adaptation. The Facebook Live tool allowed the academics and students to engage in course content and also allowed learners to be included as active participants as they constructed a learning environment rooted in social interaction, knowledge exchange, and optimum cognitive development with their peers.

Fourthly, the findings of this study provide further evidence of the appropriateness and applicability of Rogers' (2003) Diffusion of Innovation Theory in exploring how academics integrate ICT into their pedagogical practice and the beliefs, as well as the perception and attitudes of academics towards ICT integration in higher education and in educational environments (Ntemana & Olatokun, 2012; Sahin, 2006b). The study findings make a contribution to and complement the body of literature, which seeks to validate the existing diffusion of innovation models in academic communities and in a developing country like Uganda. While this investigation was not a comparative study, the results and issues that emerged from it are quite similar to those in other parts of the world, such as the United States (Jacobsen, 2000), the United Kingdom (Browne et al., 2006), and Turkey (Sahin, 2006b). Studies on African HEIs and the diffusion of innovation models have been conducted in South and West African settings. Only a few prior works exist on ICT adoption and use in universities in the East African region (Amutabi, 2012; Farrell, 2007; Kasozi 2008; Mtebe et al., 2016; Tusubira et al., 2007) and Uganda in particular.

Chapter 6 presents a summary of the findings of this study, and concludes the study with recommendations for future research.

CHAPTER 6

SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSIONS

IMPLICATIONS FOR PRACTICE, POLICY AND RESEARCH

6.1 Introduction

In this chapter, the key findings of this research are summarised with reference to the research questions and the theoretical framework context of the study. Based on the findings of this study, recommendations are made for practice and policy makers to improve ICT integration efforts in teaching and learning at Higher Education Institutions, more so in resource-constrained environments. Substantive reflections on the significant findings of the study that contribute to the scholarly domain are highlighted. This section also proposes areas for further research. This study was placed within the context of Higher Education Institutions (HEIs), specifically, a university in Uganda. The study purposed to explore how academics at a university were integrating ICT into their teaching practice. In responding to the main research question: “How do academics at a university integrate ICT into their teaching practice?” two specific questions were derived from the research and were addressed through the analysis of the interview results. These were supplemented by observations and document analysis.

6.2 Summary of the key findings

Pedagogical practices

In response to the main research question, the findings of this study indicate that the teaching practices of the participating academics were rooted in their beliefs, attitudes and perceptions about ICT. The academics integrated technology into teaching because they believed that the use of technology enhanced their teaching practices. At the lower end of technology appropriation, proprietary software like Microsoft Office suite applications were used to create enriched course material such as classroom PowerPoint presentation slides in which visual illustration such as video clips, audio files and images were embedded. Electronic handouts that were made available through platforms such as the Learning Management System (LMS) and the various social media platforms also contained links to various online resources that

supplemented the lecture material. Lindsay (2006) asserts that lecturers in such cases also employ ICT in the preparation of presentations and guiding students towards online reading material. Christie and Garrote (2011) explain that within universities, technologies like the LMS have been extensively used as a one-way (asynchronous) provision of course material to students.

The academics' ICT integration efforts were an attempt to deliver a better teaching experience in light of the available ICT tools. It is worthwhile to note that desktop computers and personal laptops, together with data projectors were the most commonly used tools in the classroom environment. The participants also used the internet, mostly as an information resource. Whilst the academics were encouraged to make use of the available ICT tools, they were not compelled or coerced to integrate them into their teaching practice, and thus used them of their own volition. This implied that they saw value in the role of technology in delivering enriched course content in a more organised manner. Furthermore, technology played a role in their need to cover course content within the allocated class time. According to Rampersad (2011) and Jacobsen (2000), faculties integrate ICT to improve and maximise course content delivery and get more done in the prearranged class time.

At the higher end of technology use, the findings of this study revealed that the use of social media technologies such as Facebook, blogs and WhatsApp was a new phenomenon at this university. In addition to using social media technologies to share course material and for collaboration, online discussion groups were created by the academics to extend classroom discussions beyond the confines of the physical classroom and to provide students with instant feedback. More significantly, this study found that two academics were using Facebook's Live streaming feature to carry out live broadcasts as part of their innovative teaching practice. I put forward the view that these academics were keen on exploring this technology to find convenient ways to interact with their students without losing focus of the curriculum goals.

It is apparent that the academics were eager to use ICT in their teaching and learning practice, however their efforts were curtailed by either a lack of ICT tools or a lack of confidence arising from inadequate ICT skills, making it difficult for them to use the available tools. The university's intent for academics and students to use the LMS was inhibited by its unreliability. Furthermore, the LMS's association with a steep learning curve also made it unpopular among some of the academics. In this study, the use of ICT for teaching and learning is perhaps an indication of the increasing importance that academics attach to the use of ICT in higher

education. The ease and convenience that ICT tools brought to the pedagogical practices of these academics cannot be ignored. The academics were not pressurised or coerced to make use of ICT in their practice. Their failure to use ICT, in many instances, was an indicator of the underlying inhibitors to ICT integration in their teaching and learning practice. Justus (2017) avers that ICT integration by faculty members can be inhibited by extensive learning curves that characterise some technologies. He also cites ignorance regarding the new approaches that are available for effective instruction as primary challenges to ICT integration.

The evolving role of academics

This study offers significant insights into the evolving role of academics in higher education in the use of ICT for teaching. The academics in this investigation were repositioning themselves as facilitators of learning and no longer viewed themselves as the ‘know-it-all’ dispensers of knowledge, which is characteristic of traditional educational practices. They understood that students had different learning abilities and believed that they therefore learnt at different paces. As such, the academics sought constructivist approaches to teaching that would accommodate the different types of learners in their classes. ICT gave them an opportunity to incorporate multimedia and other illustrations to stimulate the auditory and visual learning abilities of their students. Social media technologies such as Facebook, Blogs and WhatsApp encouraged active learning among students through online discussions that were meant to scaffold learning. According to Amin (2016), faculties’ role is shifting from mere preaching to mentoring to ensure student learning and to motivate both fast and slow learners in the digital era. Justus (2017) explains that social media tools such as Facebook are used by faculty members primarily to actively and constructively engage students through communities of practice in the form of Facebook groups.

The findings of this study revealed that some of the academics’ practices remained inclined towards teacher-centred approaches, which they attributed to the large number of students in their classes. The conventional ways that were employed by some academics to deliver notes to students did not allow for many questions or discussions because scheduled class time was largely spent on taking notes with little or no time left for discussion. These academics may have encouraged rote learning and stifled students’ development of higher-order skills. The use of ICT altered academic practices in ways that allowed for more formal and informal interactions among academics and students. Through these discussions and collaborations, students were encouraged to become independent learners and thinkers that actively

participated in the construction of knowledge with the lecturer as their guide. Linn and Eylon (2011) find that the use of ICT in the classroom can support constructivist learning approaches that allow for authentic learning experiences.

Self-development

The findings of this study revealed that the academics had a firm belief that ICT has great potential to change the educational environment, and that if well exploited, it can improve the teaching and learning process. The academics were intrinsically motivated to acquire ICT competencies and skills in the use of new technologies that they planned to apply in their teaching practice. They believed that their new role required that they must be competent and confident in technological, content and pedagogical knowledge to be able to integrate ICT effectively into their practice (Mishra & Koehler, 2007). As such, the academics were eager to acquire new ICT skills that would enhance their pedagogical practice (Bandura, 1997). The findings show that some of the academics' self-efficacy skills increased due to successful experiences with social networking tools such as Facebook Live. Similarly, the academics made efforts to learn basic ICT skills that involved the use of word processing and presentation applications, in addition to teaching themselves how to source information from the internet.

Mishra and Koehler (2007) aver that academics should be encouraged and supported to develop technological pedagogical content knowledge. The academics' beliefs and attitudes were informed by their competencies and, in turn, this determined their classroom practice (Vandeyar, 2006). Many of the academics agreed that ICT provided a range of innovative tools that skilled academics could integrate into their practice to attain a number of results in their teaching space (Ruthven et al., 2006). This study therefore revealed that it is important for academics to acquire essential ICT skills and competencies to exploit the potential that ICT brings to teaching and learning as they prepare to confront the educational challenges of the 21st century.

This study revealed that training programmes organised by the university did not address the immediate pedagogical needs of the academics. I argue that it is important for academics to be consulted regarding their needs and the design of training programmes that cater to ICT pedagogy rather than generic skills training.

The findings of this study indicate that the resistance of some academics to the integration of ICT tools such as the LMS in their pedagogical practice was rooted in the negative attitudes

they held regarding its use. The academics believed that the LMS had a steep learning curve and, as such, were reluctant to make use of it in their teaching practice. Karaseva et al. (2015) report that appropriate training may help academics to overcome qualms about their beliefs regarding instructional technologies.

Beliefs and attitudes

This study also revealed that academics positively viewed the integration of ICT since they believed that ICT was an “excellent tool” for engaging with the students and accommodating their interests. The academics felt that ICT exposed learners to richer and sociable learning spaces and also motivated them to engage in self-directed learning (Shin et al., 2012). ICT was perceived to be an important motivational tool for academics as it provided them with opportunities to actively engage with their students, and encouraged them to be more innovative in their approach to their work. Similarly, the academics believed that integrating ICT tools into their practice was very important and necessary because it exposed both academics and students to a wider range of information resources that were relevant and current. It also made it possible for students to experience real-world contexts that stimulated their empathy, making learning more exciting and meaningful.

However, the academics worked in a resource-constrained environment with a plethora of challenges, which comprised the lack of access to ICT, a lack of infrastructure and technical support, as well as a lack of institutional ICT policy and supporting guidelines (Mumtaz, 2000b; Shaikh & Khoja, 2011). The findings of this study indicate that the academics were relentless in their resolve to integrate ICT into their teaching practice. The academics viewed ICT as a tool for enhancing their teaching practice and were determined to make the best use of the available ICT tools to improve their teaching repertoire. Their knowledge and skills were also found to influence their attitudes and beliefs regarding ICT integration. The lack of particular knowledge about ICT has been noted to inhibit technology integration (Gu, Zhu & Guo, 2013). Challenges notwithstanding, the academics were striving with great conviction to alter the way in which they taught by enriching and updating their course content using the available ICT tools. The academics firmly believed that the institution investing in facilities like a digital lab, and making efforts to improve and expand on the campus-wide internet connectivity, this would galvanise the use of ICT in teaching and learning (Tusubira et al., 2007).

6.3 Interpretation of the findings against the theoretical framework

The study created an opportunity to view and understand academics' ICT integration as a practice that was rooted in their beliefs and attitudes (Sahin & Thompson, 2006). The academics in this study seemed to examine the value of ICT tools before they considered their integration into their teaching practice. So what motivates academics in higher education to want to use technology in their teaching practice?

I argue that the academics integrated ICT into their teaching practice based on their perception of the usefulness of the technology towards achieving their educational goals. The findings indicate that the academics felt that in order to meet the changing needs of the 21st century learner, they had to integrate ICT into their practice (Pheeraphan, 2013). I examined academic beliefs and attitudes as significant constructs in their decision to integrate ICT into their practice. When technology was viewed as enhancing the teaching and learning experience of the class, the academics were more inclined to adopt it. While many academics may agree that technology enhances their classroom experience, many will not use these tools (Wright & Wilson, 2007). ICT integration therefore moves the debate beyond 'access' to various tools and equipment, it is rather the means of improving academics' productivity, as well as promoting students' learning and engagement (Gülbahar, 2007).

Rogers (2003) argues that the innovative practices of academics are based on the subjective evaluations of academics who have already adopted the innovation and those that perceive the innovation to be of value in their practice. The findings of this study revealed that within this social system, academics are change agents who can then affect the integration of ICT in education. Their desire to change their pedagogical practices prompted their decision to integrate ICT into their teaching. When academics are faced with new demands in their practice, they will adopt technology (Casmar, 2001). If academics perceive ICT to be of value (relative advantage) in their teaching pedagogy, then they will make an effort to use it (Sahin & Thompson, 2006). For ICT to be successfully integrated into academics' practices, academics should view it as providing help and experience to them and their students (Sahin, 2006b).

When the academics perceived particular innovative practices, such as the use of social media for teaching, as compatible with their individual needs, they were eager to make use of those tools. Hoerup (2001) avers that beliefs and values about teaching are influenced by each

innovation and that the compatibility of the innovation tends to increase its adoption rate. The complexity of some innovations informed the integration of ICT into the academics' practices (Rogers, 2003). In this study, I found that the ability of the academics to experiment with particular tools made a difference in their ICT integration experiences. In summary, the findings of this study indicate that all of Rogers' Diffusion of Innovation (DoI) constructs (see Figure 6.11) had a significant effect on the attitude and beliefs of the participating academics regarding ICT integration in their teaching practice (Rogers 2003).

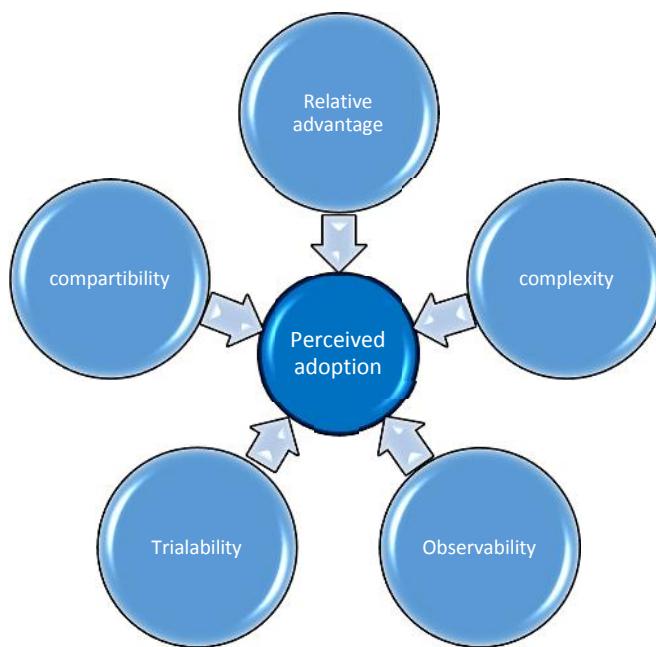


Figure 6.1: Innovation attributes (Rogers, 2003)

Why did some academics at this university choose not to use ICT in their teaching practice or use it in a minimal manner? Inadequate training in the use of technology and a lack of confidence seemed to be significant contributing factors to their reluctance to use these tools. Some of the academics viewed some of the ICT tools as complex to use since they had received no prior training in their use. The findings of this study indicate that a lack of ICT integration occurs when academics are not familiar with the ICT tools available (Al-Bataineh, Anderson, Toledo & Wellinski, 2008). A lack of familiarity meant that these academics did not have a chance to experiment (trialability) with these tools and thus could not integrate them into their practice. The findings also revealed that the academics' attitudes and beliefs were also affected by their knowledge and skills. The lack of particular knowledge and academics' beliefs and attitudes regarding ICT use were noted to be inhibitors of technology integration (Gu et al., 2013). Academics' passion prior to ICT integration has to be taken into consideration. When

academics do not believe that the innovation supersedes (Relative advantage) what they are using, they are bound to shun its use. Hicks (2011) posits that intimidation and inadequacy are major reasons why some academics continue to resist ICT use. The fear is intensified by the idea of “looking stupid” in front of their tech savvy students (p. 189). Kukulska-Hulme (2012) indicates that the training that faculty members receives is a key factor in the effectiveness of ICT integration.

6.4 Significance of the findings - new knowledge generated

The new knowledge that emerged and pushed boundaries in this field of study was twofold in nature. Firstly, the academics were using social media technology, like Facebook Live streaming, as a new approach to engaging students and delivering course content. Secondly, the academics demonstrated significant resilience and persistence in their pursuit to integrate ICT into their teaching practice regardless of the constraining contextual conditions.

This is contrary to the extant literature (Browning et al., 2011; Prescott, 2014; Shelton, 2013) on the integration of ICT in the higher education sector. Shelton (2013) posits that social networking tools are among the least used technologies in teaching and learning because lecturers do not view these technologies as having an impact on their pedagogy, and lecturers also lack the confidence to use these tools in practice. Prescott’s (2014) study showed that the majority of the faculty did not want to make use of Facebook for educational purposes in their courses because social networking sites like Facebook presented new legal, ethical and professional challenges for academics as well as students. Browning et al. (2011) aver that social media has not been embraced by academics as an instruction tool partly because academics are not aware of the opportunities that exist to leverage the power of social media in teaching. This study found that the academics were using social media technologies, specifically Facebook Live, as a new approach to course delivery. The academics in this investigation used social media streaming features to synchronously conduct class discussions in real time. The use of Facebook Live to conduct real-time class discussions is an indication of the academics’ desire to find new and convenient approaches to teaching and learning. This study finding pushes the boundaries in this field of study by providing a deep and meaningful insight into academics’ use and perceptions of the use of social media for teaching and learning. The academics were curious to explore new approaches to teaching and learning, to provide feedback, and to allow interactions with learners beyond the confines of the classroom walls. This study shows that academics are using innovative tools such as social media not only to

deliver course content, but also to actively engage their learners in the co-construction of knowledge.

There is a dearth of literature that investigates academics' resilience and perseverance to use ICT in their teaching repertoire. The revelation that the academics in this study were relentless in their pursuit to integrate ICT into their pedagogical practice is a new phenomenon that pushes the boundaries in this field. This study has highlighted the resilience of academics at Kusoma University, despite the fact that they operated in a resource-constrained environment. Regardless of the numerous inhibiting factors that these academics experienced (lack of access to ICT, lack of infrastructure and technical support, and a lack of institutional ICT policy and supporting guidelines), they were determined to persist and make technology work for them in the teaching and learning process. The extant literature (Gaffar et al., 2011; Kwabena Ayeh, 2008; Nyirongo, 2009; Tusubira et al., 2007) on the integration of ICT in teaching reveals that academics in resource-constrained countries tend to abandon the adoption of ICT in their practice if they are confronted with unfavourable contextual conditions or challenges. This study found that despite a resource-constrained environment and technological challenges, the academics were resilient and more determined than ever to embrace ICT in their teaching practice.

6.5 Research assumptions revisited

A number of research assumptions were presented in the beginning of the study and these are now revisited in the light of the findings of this study.

Assumption 1:

Academics' access to technology will culminate in technology integration.

The current study's findings do not support this assumption. Access to various ICT tools and equipment did not necessarily culminate in the integration of ICT into the teaching practices of the academics (Gulbahar, 2008; Wright & Wilson, 2007). Whilst the institution had basic ICT infrastructure and applications, not all of the academics were eager to make use of the available ICT in their teaching practice. I posit that academics should be encouraged to make use of the available ICT to enrich and enhance their teaching repertoire.

Assumption 2:

The beliefs, perceptions and attitudes of academics will influence their decision to integrate

technology into their practice. In other words, academics' beliefs about ICT and its affordances will influence their practice (Faggiano, 2004; Sahin, 2006b).

The findings of this study were twofold. The beliefs, perceptions and attitudes of some of the academics were found to influence ICT integration in their teaching practice. The innovative behaviour of these educators was associated with the need to rethink existing didactical practices (Montrieux et al., 2015). The findings also show that there were some academics in this study who did not believe in the need to adopt ICT in their teaching practice because they were comfortable with the traditional teaching approaches.

Assumption 3:

Academics at HEIs will use available technologies for situated learning or self-efficacy to improve their teaching practice (Townsend, 2010).

The findings regarding this assumption were twofold. The academics were willing to learn new ICT skills if they believed that these skills were compatible with their needs and that these would enhance their current teaching practices. Similarly, the findings show that they were reluctant to learn and work with particular technologies (Such as the LMS) if they believed that these were not compatible with their needs and if they perceived these as difficult to use. I posit that academics should be encouraged to engage with different instructional technologies that they are comfortable with, and that institutions should create environments that are conducive to experimentation with different technologies. Secondly, in-house awareness campaigns should be conducted so that academics are informed of the opportunities that ICT presents for their teaching practice.

Assumption 4:

The integration of ICT will transform the teaching and learning process (Amin, 2016; Hennessy et al., 2005; Shelly et al., 2006; Sutherland et al., 2004).

The findings regarding this assumption were twofold. Firstly, it was found that much of the technology employed served to replicate or supplement traditional practices of course delivery rather than transform teaching. The academics primarily used ICT as a substitute for conventional practices of content delivery. The study results show that ICT integration practices provoked the entrenchment of conservative practices among some of the academics. The academics used the LMS platform largely as a course content delivery tool. Instead of ICT revolutionising their education practices, ICT strengthened the traditional instructional

structures that are characteristic of ancient didactic models. Alternatively, it was also found that there were some academics that innovatively used social media technologies to transform their teaching practices. They were able to engage with their students in the co-construction of knowledge. Through online discussion and communities of practice, the academics evoked critical thinking among their students in their interactions using Facebook groups and blogs. I posit that some of the academics' pedagogy change, while it remained conventional for others. Some of the participants indicated that they used ICT in ways that allowed the active participation of students. I also posit that the use of ICT, and more so Web 2.0 technologies, for teaching and learning will have a significant role in the future of teaching and learning in higher education and therefore more academics should embrace it in their practice.

6.6 Implications for practice and policy

Implications for practice

Academics need professional development initiatives that are tailored to their pedagogical needs and that will enhance their teaching. These initiatives must be widely distributed throughout the university and rewards for successful innovation and practice could create new pathways through recognition of good practice. Flexible training schedules that are tailored to individual pedagogical needs could significantly enhance the integration of ICT in teaching and learning. Training must be sustained, and academics need to share the lessons learnt and best practice by creating communities of practice where they can support each other in their efforts to integrate ICT into teaching.

The university should establish and empower an ICT technical unit and help desk for both academics and students. This unit will be instrumental in training, maintenance and information dissemination. When training is carried out, it is important that follow-ups are conducted as academics require close support, more so when they apply what they have learned in their training in the classroom. Short of that, academics' enthusiasm regarding what they have learned will diminish once the training is complete.

Implications for policy

There is a need to set up a favourable ICT adoption and utilisation environment through improvement in ICT infrastructure at the university and increased access to ICT. Policy makers should put emphasis on driving the integration of these technologies rather than the continued investment in new ICT with little or no thought to their placement.

This study entrenches academics as key players in the integration of ICT in higher education. For academics to successfully integrate ICT into their practice, they should be knowledgeable in the use of basic ICT tools such as desktop computers. There should be a concerted effort to create and promote awareness campaigns and the training of staff on ICT use in teaching and learning.

Higher Education Institutions need to develop ICT policies that are aligned with the attainment of shared educational goals

6.7 Suggestions for further research

Any qualitative study will uncover more that needs investigation, and opportunities for further research are always plentiful. The ICT integration landscape is rich with possibilities for research in pedagogical application. A number of areas for possible research were identified as a consequence of this study:

- How does the professional environment support the practices of academics' integration of ICT into teaching at university?
- How does the use of social media influence student learning in HEIs?
- How does technology integration influence authentic learning in HEIs?
- How can effective ICT communities of practice be established in higher education to influence pedagogical change?
- An investigation into the correlation between levels of digital fluency and willingness to experiment with emergent technologies for teaching and learning.

6.8 Conclusion

This study purposed to explore how academics were integrating ICT into their teaching and learning practices at a university in Uganda. Two specific research questions were addressed in the exploration of this phenomenon. The answers to these questions highlighted a refined understanding of how the participating academics employed ICT in their teaching practice within the university context, as well as how their beliefs and attitudes influenced their integration of ICT in teaching. The adoption of ICT in instructional practice continues to raise a number of debates among researchers and practitioners. There is no doubt that ICT integration avails academics with particular affordances in the education realm in the form of flexibility,

collaboration, and communication (Moran, Seaman & Tinti-Kane, 2011; Pheeraphan, 2013; Sarkar, 2012). Several studies (Benson & Morgan, 2013; Siemens & Tittenberger, 2009) have demonstrated that ICT integration enhances the teaching and learning process in many ways. This qualitative study highlighted the different ways in which academics were prepared to integrate ICT into their pedagogical practices in a resource-constrained setting. It demonstrated that academics' beliefs and attitudes influenced their usage of ICT. This research shows that although there was some apprehension from the academics regarding the changes taking place in instruction through the use of ICT, these were outweighed by their positive attitudes in embracing change and being ready for the challenges to be experienced in implementing ICT.

The academics found that teaching through online networks could be an effective approach to reinforcing learning. They also realised that their teaching styles (change) and their roles should become that of a facilitator if they were to meet 21st century learning requirements (Amin, 2016; Bates, 2015; Bonk & Kim, 2006). To achieve this, academics should be equipped with the relevant technological skills and knowledge to be able to effectively integrate ICT into the teaching and learning process.

REFERENCES

- Adam, L. (2003). Information and communication technologies in higher education in Africa: Initiatives and challenges. *Journal of Higher Education in Africa*, 1(1), 195-221.
- Adeoye, Y.M., Oluwole, A.F., & Blessing, L.A. (2013). Appraising the Role of Information Communication Technology (ICT) as a Change Agent for Higher Education in Nigeria. *International Journal of Educational Administration and Policy Studies*, 5(8), 177-183.
- Aduke, A.F. (2008). Usage and Challenges of Information Communication Technology (ICT) in teaching and learning in Nigerian Universities. *Asian Journal of Information Technology*, 7(7), 290-295.
- Afifi, G.M. (2011). E-learning as an alternative strategy for tourism higher education in Egypt. *Quality Assurance in Education*, 19(4), 357-374.
- Agbonlahor, R.O. (2006). Motivation for Use of Information Technology by University Faculty: a developing country perspective. *Information Development*, 22(4), 263-277.
- Agostinho, S., Oliver, R., Harper, B., Hedberg, J., & Wills, S. (2002). *A tool to evaluate the potential for an ICT-based learning design to foster high-quality learning*. Winds of Changing in the Sea of Learning, Proceedings of the 19th Annual Conference of the Australian Society for Computers in Tertiary Education (ASCILITE), Auckland, New Zealand, 8-11 December 2002.
- Ahern, K.J. (1999). Ten tips for reflexive bracketing. *Qualitative health research*, 9(3), 407-411.
- Ahmad, T. (2015). Preparing for the future of higher education. *On the Horizon*, 23(4), 323-330.
- Ahmad, T.B.T., Madarsha, K.B., Zainuddin, A.M.H., Ismail, N.A.H., & Nordin, M.S. (2010). Faculty's acceptance of computer based technology: Cross-validation of an extended model. *Australasian Journal of Educational Technology*, 26(2).
- Ahmadi, S., Keshavarzi, A., & Foroutan, M. (2011). The Application of Information and Communication Technologies (ICT) and its Relationship with Improvement in Teaching and Learning. *Procedia - Social and Behavioral Sciences*, 28(0), 475-480. doi:10.1016/j.sbspro.2011.11.091

- Ajjan, H., & Hartshorne, R. (2008). Investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical tests. *The Internet and Higher Education*, 11(2), 71-80.
- Al-Bataineh, A., Anderson, S., Toledo, C., & Wellinski, S. (2008). A study of technology integration in the classroom. *International Journal of Instructional Media*, 35(4), 381-388.
- Al-Senaidi, S., Lin, L., & Poirot, J. (2009). Barriers to adopting technology for teaching and learning in Oman. *Computers & Education*, 53(3), 575-590.
- Al-Sharqi, K.L.M., Hashim, K., & Ahmed, P.S. (2015). Improving the Learning Environment at a University in Saudi Arabia: Identifying Factors That Impede or Motivate Learning. *International Journal of Sciences: Basic and Applied Research IJSBAR*, 19(2), 234-249.
- Alajmi, M. (2011). *Modeling student perception of Web 2.0 technologies adoption in Kuwait*: University of North Texas.
- Alavi, M., & Leidner, D.E. (2001). Research commentary: Technology-mediated learning—A call for greater depth and breadth of research. *Information systems research*, 12(1), 1-10.
- Albion, P. (1999). *Self-efficacy beliefs as an indicator of teachers' preparedness for teaching with technology*. Paper presented at the Proceedings of the 10th International Conference of the Society for Information Technology & Teacher Education. SITE, 1999.
- Aleksic-Maslac, K., & Magzan, M. (2012). ICT as a tool for building social capital in higher education. *Campus-Wide Information Systems*, 29(4), 272-280.
- Alghamdi, S.R. (2016). Use and attitude towards Learning Management Systems (LMS) in Saudi Arabian universities. *Eurasia Journal of Mathematics, Science & Technology Education*, 12(10). doi:10.12973/eurasia.2016.1281a
- Ali, S.N. (2012). *Malaysian polytechnic lecturers' teaching practices with ICT utilization to promote higher-order thinking skills*. Graduate Theses and Dissertations. 12623. Available from <http://lib.dr.iastate.edu/etd/12623>

Alkhafaf, S., Drew, S., AlGhamdi, R., & Alfarraj, O. (2012). E-Learning System on Higher Education Institutions in KSA: Attitudes and Perceptions of Faculty Members. *Procedia - Social and Behavioral Sciences*, 47(0), 1199-1205.
doi:10.1016/j.sbspro.2012.06.800

Allen, I.E., & Seaman, J. (2010). *Learning on Demand: Online Education in the United States*. ERIC. Available from <https://eric.ed.gov/?id=ED529931>

Allen, J., & van der Velden, R. (2012). *Skills for the 21st century: Implications for education*. Research Memorandum 044, Maastricht University, Maastricht Research School of Economics of Technology and Organization (METEOR).

Almrashdeh, I.A., Sahari, N., Zin, N.A.M., & Alsmadi, M. (2011). Distance learning management system requirements from student's perspective. *Journal of Theoretical & Applied Information Technology*, 24(1).

Altbach, P.G., Reisberg, L., & Rumbley, L.E. (2009). *Trends in global higher education: Tracking an academic revolution*. Chestnut Hill, MA: Boston College Center for International Higher Education.

Altun, S.A., Kalayci, E., & Avci, Ü. (2011). Integrating ICT at the Faculty Level: A Case Study. *Turkish Online Journal of Educational Technology*, 10(4).

Amin, J.N. (2016). Redefining the Role of Teachers in the Digital Era. *The International Journal of Indian Psychology*, 3(3, No. 6), 40.

Amutabi, M.N. (2012). *Prospects and Dilemmas of Information and Communication Technology (ICT) in University Education in Africa: The Case of Kenya*. UNESCO. Available from <http://portal.unesco.org>.

An, H., Alon, S., & Fuentes, D. (2014). iPad Implementation Approaches in K-12 School Environments. *Tablets in K-12 Education: Integrated Experiences and Implications: Integrated Experiences and Implications*, 22.

Ananiadou, K., & Claro, M. (2009a). *21st Century Skills and Competences for New Millennium Learners in OECD Countries*. OECD Education Working Papers, No. 41, OECD Publishing, Paris. Available from <http://dx.doi.org/10.1787/218525261154>.

Andema, S. (2009). Digital literacy and teacher education in Uganda: the case of Bondo Primary Teachers' College (PTC). *Reading & Writing*, 4(1), Art. #27, 1-8.

- Andema, S., Kendrick, M., & Norton, B. (2013). Digital literacy in Ugandan teacher education: Insights from a case study. *Reading & Writing*, 4(1). doi:10.4102/rw.v4i1.27
- Anfara, V.A., & Mertz , N. T. (2014). *Theoretical frameworks in qualitative research*. Thousand Oaks, CA: Sage publications.
- Angrosino, M.V. (2005). Recontextualizing observation: Ethnography, pedagogy, and the prospects for a progressive political agenda. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 729-745). Thousand Oaks, CA, : Sage Publications Ltd.
- Archibong, I.A., Ogbiji, J., & Anijaobi-Idem, F. (2010). ICT competence among academic staff in universities in Cross Rivers State, Nigeria. *Computer and Information Science*, 3(4), p109.
- Argyris, C., & Schon, D.A. (1974). *Theory in practice: Increasing professional effectiveness*: San Francisco: Jossey-Bass.
- Asiri, M.J.S. (2012). Factors influencing the use of learning management system in Saudi Arabian Higher Education: A theoretical framework. *Higher Education Studies*, 2(2), 125-137.
- Audi, R. (2010). *Epistemology: A contemporary introduction to the theory of knowledge*. United Kingdom: Routledge.
- Ayeh, J.K. (2008). Information communications technology and global education: The challenges of the African virtual university learning centres in Ghana. *Information Development*, 24(4), 266-274.
- Ayoo, P.O. (2009). Reflections on the digital divide and its implications for the internationalization of higher education in a developing region: The case of East Africa. *Higher Education Policy*, 22(3), 303-318.
- Backhouse, J. (2013). What makes lecturers in higher education use emerging technologies in their teaching? *Knowledge Management & E-Learning: An International Journal (KM&EL)*, 5(3), 345-358.
- Baker, S.E., Edwards, R., & Doidge, M. (2012). *How many qualitative interviews is enough?: Expert voices and early career reflections on sampling and cases in qualitative research*. National Centre for Research Methods Review Paper. Available from http://eprints.ncrm.ac.uk/2273/4/how_many_interviews.pdf

Balanskat, A., Blamire, R., & Kefala, S. (2006). The ICT impact report. *European Schoolnet*, 1, 1-71.

Balanskat, A., & Gertsch, C.A. (2010). Review of national curricula and assessing digital competence for students and teachers: Findings from 7 countries. *Brussels: European Schoolnet*.

Bandura, A. (1997). *Self-efficacy: The exercise of control*: Macmillan.

Barron, B. (2006). Interest and self-sustained learning as catalysts of development: A learning ecology perspective. *Human Development*, 49(4), 193-224.

Barsky, E., & Purdon, M. (2006). Introducing Web 2.0: social networking and social bookmarking for health librarians. *Journal of the Canadian Health Libraries Association/Journal de l'Association des bibliothèques de la santé du Canada*, 27(3), 65-67.

Barton, R. (2004). *Teaching Secondary Science With Ict*. UK: Open University Press.

Basaza, G.N., Milman, N.B., & Wright, C.R. (2010). The challenges of implementing distance education in Uganda: A case study. *The International Review of Research in Open and Distance Learning*, 11(2), 85-91.

Basit, T. (2003). Manual or electronic? The role of coding in qualitative data analysis. *Educational research*, 45(2), 143-154.

Bassey, M. (1999). *Case study research in educational settings*. UK: McGraw-Hill Education.

Bates, A.W. (2015). Teaching in a digital age. *Glokalde*, 1(3).

Bates, T. (2001). The continuing evolution of ICT capacity: The implications for education. *The changing faces of virtual education*, 29-46.

Baylor, A.L., & Ritchie, D. (2002). What factors facilitate teacher skill, teacher morale, and perceived student learning in technology-using classrooms? *Computers & Education*, 39(4), 395-414.

Becher, T., & Trowler, P. (2001). *Academic tribes and territories: Intellectual enquiry and the culture of disciplines*. UK: McGraw-Hill Education.

Becta, I. (2004). Getting the most from your Interactive Whiteboard” A guide for secondary schools, Dated 2004. Becta, ICT advice. Available from

http://39lu337z5111zjr1i1ntpio4.wpengine.netdna-cdn.com/wp-content/uploads/2016/04/getting_most_whiteboard_secondary.pdf

- Ben Youssef, A., & Dahmani, M. (2008). The Impact of ICT on Student Performance in Higher Education: Direct Effects, Indirect Effects and Organisational Change. *Revista de Universidad y Sociedad del Conocimiento, RUSC*, 5(1), 13.
- Benson, V., & Morgan, S. (2013). Student experience and ubiquitous learning in higher education: Impact of wireless and cloud applications. *Creative Education*, 4(08), 1.
- Berg, B. (2007). *Qualitative research methods for the social sciences* (7th edition). Boston: Allyn & Bacon.
- Berg, B., & Lune, H. (2012). *Qualitative research methods for the social sciences* (8th edition). London: Pearson.
- Bernard, H. (2006). *Research methods in anthropology: qualitative and quantitative approaches* (4th edition). Laham, New York, Toronto and Oxford: Altamira Press.
- Bhasin, B. (2012). Integration of Information and Communication Technologies in Enhancing Teaching and Learning. *Contemporary Educational Technology*, 3(2), 130-140.
- Bingimlas, K.A. (2009a). Barriers to the Successful Integration of ICT in Teaching and Learning Environments: A Review of the Literature. *Eurasia Journal of Mathematics, Science & Technology Education*, 5(3), 235-245.
- Bingimlas, K.A. (2009b). Barriers to the successful integration of ICT in teaching and learning environments: A review of the literature. *Eurasia Journal of Mathematics, Science & Technology Education*, 5(3).
- Blaikie, N. (2009). *Designing social research*. UK: Polity.
- Bless, C., & Higson-Smith, C. (1995). *Fundamentals of social research methods: An integrated approach to research design, measurement and statistics*. London: Sage Publishers.
- Blignaut, A., & Howie, S. (2009). National policies and practices on ICT in education: South Africa. *Cross-national ICT policies and practices in education*, 653-670.
- Blin, F., & Munro, M. (2008). Why hasn't technology disrupted academics' teaching practices? Understanding resistance to change through the lens of activity theory. *Computers & Education*, 50(2), 475-490.

- Bober, M.J. (2002). Technology integration: The difficulties inherent in measuring pedagogical change. *TechTrends*, 46(1), 21-24.
- Bogdan, R.C., & Biklen, S.K. (1998). *Qualitative research in education. An introduction to theory and methods*. Boston: Allyn & Bacon.
- Bonk, C., & Kim, K.J. (2006). The future of online teaching and learning in higher education: The survey says. *EDUCAUSE Quarterly Magazine*, 29(4), 22-30.
- Bonnett, M., McFarlane, A., & Williams, J. (1999). ICT in subject teaching: an opportunity for curriculum renewal? *Curriculum journal*, 10(3), 345-359.
- Borg, S. (2001). The research journal: A tool for promoting and understanding researcher development. *Language Teaching Research*, 5(2), 156-177.
- Bowen, G.A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, 9(2), 27-40. doi:10.3316/qrj0902027
- Brabec, K., Fisher, K., & Pitler, H. (2004). Building Better Instruction: How Technology Supports Nine Research-Proven Instructional Strategies. *Learning & Leading with Technology*, 31(5), 6-11.
- Brennan, J., & Naidoo, R. (2008). Higher education and the achievement (and/or prevention) of equity and social justice. *Higher education*, 56(3), 287-302.
- Brill, J.M., & Galloway, C. (2007). Perils and promises: University instructors' integration of technology in classroom based practices. *British Journal of Educational Technology*, 38(1), 95-105.
- Brown, J.S. (2000). Growing up: Digital: How the web changes work, education, and the ways people learn. *Change: The Magazine of Higher Learning*, 32(2), 11-20.
- Brown, L., & Holloway, I. (2008). The initial stage of the international sojourn: excitement or culture shock? *British Journal of Guidance & Counselling*, 36(1), 33-49.
- Brown , S. (2002). Re-engineering the university. *Open learning*, 17(3), 231-243.
- Brown, S. (2010). Re-engineering the University. *Open Learning: The Journal of Open, Distance and e-Learning*, 17(3), 231-243. doi:10.1080/0268051022000048237
- Brown, S.A. (2012). Seeing Web 2.0 in context: A study of academic perceptions. *The Internet and Higher Education*, 15(1), 50-57.

- Browne, T., Jenkins, M., & Walker, R. (2006). A longitudinal perspective regarding the use of VLEs by higher education institutions in the United Kingdom. *Interactive Learning Environments*, 14(2), 177-192.
- Browning, L., Gerlich, R.N., & Westermann, L. (2011). The new HD Classroom: a "Hyper Diverse" approach to engaging with students. *Journal of Instructional pedagogies*, 5, 1.
- Bryderup, I., Larson, A., & Trentel, M.Q. (2009). ICT-use, educational policy and changes in pedagogical paradigms in compulsory education in Denmark: From a lifelong learning paradigm to a traditional paradigm? *Education and Information Technologies*, 14(4), 365-379.
- Bryderup, I.M., Larson, A., & Quisgaard Trentel, M. (2009). ICT-use, educational policy and changes in pedagogical paradigms in compulsory education in Denmark: From a lifelong learning paradigm to a traditional paradigm? *Education and Information Technologies*, 14(4), 365-379. doi:10.1007/s10639-009-9095-y
- Bryman, A. (2006). Integrating quantitative and qualitative research: how is it done? *Qualitative research*, 6(1), 97-113.
- Buabeng-Andoh, C. (2012). Factors influencing teachers' adoption and integration of information and communication technology into teaching: A review of the literature. *International Journal of Education and Development using Information and Communication Technology*, 8(1), 136.
- Burbules, N., & Callister, T. (2000). Universities in transition: The promise and the challenge of new technologies. *The Teachers College Record*, 102(2), 271-293.
- Burrough, K. (2015). Factors Influencing the Adoption of Learning Management Systems by Medical Faculty.
- Caers, R., De Feyter, T., De Couck, M., Stough, T., Vigna, C., & Du Bois, C. (2013). Facebook: A literature review. *New Media & Society*, 15(6), 982-1002.
- Carr, S. (2000). Army bombshell rocks distance education. *The Chronicle of Higher Education*, 46(50), A35-A36.
- Casey, D., & Murphy, K. (2009). Issues in using methodological triangulation in research: Dympna Casey and Kathy Murphy explore the advantages and disadvantages of using triangulation. *Nurse Researcher*, 16(4), 40-55.

- Casmar, S.P. (2001). The adoption of computer technology by faculty in a college of education: an analysis of administrative planning issues. *Retrieved from ProQuest Dissertations and Theses (AN 304734123)*.
- Cavanagh, S. (1997). Content analysis: concepts, methods and applications. *Nurse Researcher*, 4(3), 5-13.
- Challis, D., Holt, D., & Rice, M. (2005). Staff perceptions of the role of technology in experiential learning: A case study from an Australian university. *Australasian Journal of Educational Technology*, 21(1), 19-39.
- Chan, F.M. (2002). *ICT in Malaysian schools: Policy and strategies*. Paper presented at the Workshop on the Promotion of ICT Education to Narrow the Digital Divide, Tokyo.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative research*. London: Sage Publications Ltd.
- Charmaz, K. (2008). Constructionism and the grounded theory method. *Handbook of constructionist research*, 397-412.
- Chen, R.J. (2010). Investigating models for preservice teachers' use of technology to support student-centered learning. *Computers & Education*, 55(1), 32-42.
- Chong, S.C. (2006). KM critical success factors: a comparison of perceived importance versus implementation in Malaysian ICT companies. *Learning Organization, The*, 13(3), 230-256.
- Christie, M., & Garrote Jurado, R. (2011). *Lecturer engagement in the use of interactive tools in learning management systems. A Swedish case study*. Paper presented at Ascilite 2011, West Point, Hobart Tasmania Australia, 4-7 December 2011.
- Church, K., & de Oliveira, R. (2013). *What's up with whatsapp?: comparing mobile instant messaging behaviors with traditional SMS*. Paper presented at the Proceedings of the 15th international conference on Human-computer interaction with mobile devices and services.
- Clandinin, D.J., & Rosiek, J. (2007). Mapping a landscape of narrative inquiry: borderland spaces and tensions. In D.J. Clandinin (Ed.). *Handbook of narrative inquiry: Mapping a methodology* (pp. 35-76). Thousand Oaks, CA: SAGE Publications Ltd. doi: 10.4135/9781452226552

- Clandinin, J., Pushor, D., & Orr, A. M. (2016). Navigating Sites for Narrative Inquiry. *Journal of Teacher Education*, 58(1), 21-35. doi:10.1177/0022487106296218
- Clark, W., & Luckin, R. (2013). *What The Research Says: iPads in the Classroom*. London: Institute of Education, University of London.
- Clegg, S., Hudson, A., & Steel, J. (2003). The emperor's new clothes: globalisation and e-learning in higher education. *British Journal of Sociology of Education*, 24(1), 39-53.
- Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary Education & Management*, 11(1), 19-36.
- Cody, A. (2014). *Computerized Grading: Purloining the analysis, the most fundamental exposition of humanity*. Education Week Teacher. Available from http://blogs.edweek.org/teachers/living-in-dialogue/2014/05/computerized_grading_purloinin.html
- Collis, B., & Wende, M. (2002). *Models of technology and change in higher education: an international comparative survey on the current and future use of ICT in higher education*. Enschede: Center for Higher Education Policy Studies (CHEPS).
- Condie, R., & Livingston, K. (2007). Blending online learning with traditional approaches: changing practices. *British Journal of Educational Technology*, 38(2), 337-348. doi:10.1111/j.1467-8535.2006.00630.x
- Connelly, F.M., & Clandinin, D.J. (1990). Stories of experience and narrative inquiry. *Educational researcher*, 19(5), 2-14.
- Conole, G., & Alevizou, P. (2010). A literature review of the use of Web 2.0 tools in Higher Education. New York, UK: HEA Academy.
- Conole, G., Smith, J., & White, S. (2007). A critique of the impact of policy and funding. *Contemporary perspectives in e-learning research: Themes, methods and impacts on practice*, 38-54.
- Cooperstein, S.E., & Kocevar Weidinger, E. (2004). Beyond active learning: a constructivist approach to learning. *Reference Services Review*, 32(2), 141-148. doi:10.1108/00907320410537658

Corbetta, P. (2003). *Social research: Theory, methods and techniques*: Thousand Oaks: Sage Publications.

Corbin, J., & Strauss, A. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.

Coultsman, J. (2015). Motivating Higher Education Faculty for Technology Integration: A Private College's Approach.

Creswell, J.W. (2003). *Research design*. Thousand Oaks, CA: Sage.

Creswell, J.W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches*: London: SAGE Publications, Incorporated.

Creswell, J.W. (2012). *Qualitative inquiry and research design: Choosing among five approaches*. London: Sage publications.

Creswell, J.W., Hanson, W. E., Plano, V.L.C., & Morales, A. (2007). Qualitative research designs selection and implementation. *The counseling psychologist*, 35(2), 236-264.

Creswell, J.W., & Miller, D.L. (2000). Determining validity in qualitative inquiry. *Theory into practice*, 39(3), 124-130.

Crook, C. (2008). *Web 2.0 technologies for learning: The current landscape—opportunities, challenges and tensions*. UK: British Educational Communications and Technology Agency (BECTA)

Cross, M., & Adam, F. (2007). ICT Policies and Strategies in Higher Education in South Africa: National and Institutional Pathways. *Higher Education Policy*, 20(1), 73-95.
doi:10.1057/palgrave.hep.8300144

Crowson, D.K. (2005). *The adoption of online student services in Texas colleges and universities: An analysis based on Roger's diffusion model*. Lincoln: ETD collection for University of Nebraska - AAI3194110. Available from
<https://digitalcommons.unl.edu/dissertations/AACI3194110>

Cuban, L., Kirkpatrick, H., & Peck, C. (2001). High access and low use of technologies in high school classrooms: Explaining an apparent paradox. *American Educational Research Journal*, 38(4), 813-834.

- Czerniewicz, L., & Brown, C. (2009). A virtual wheel of fortune? Enablers and constraints of ICTs in higher education in South Africa. *Bridging the knowledge divide: Educational technology for development*, 57-76.
- Dabbagh, N., & Reo, R. (2011). Technology integration in higher education: Social and organizational aspects. Hershey, PA: IGI Global.
- Daher, T., & Lazarevic, B. (2014). Emerging instructional technologies: Exploring the extent of faculty use of web 2.0 tools at a midwestern community college. *TechTrends*, 58(6), 42-50.
- Dale, R., Robertson, S., & Shortis, T. (2004). You can't not go with the technological flow, can you?"Constructing 'ICT'and 'teaching and learning. *Journal of Computer Assisted Learning*, 20(6), 456-470.
- Davies, R.S. (2011). Understanding technology literacy: A framework for evaluating educational technology integration. *TechTrends*, 55(5), 45.
- Dawson, S., McWilliam, E., & Tan, J.P.L. (2008). Teaching smarter: How mining ICT data can inform and improve learning and teaching practice. *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*, 221-230.
- De Boer, W., & Collis, B. (2005). Becoming more systematic about flexible learning: beyond time and distance. *Research in Learning Technology*, 13(1).
- De Salas, K. (2015). Learning Styles of ICT Students: Do Differences in Disciplines Exist? *Australian Education Computing*, 29(2).
- Deaney, R., Ruthven, K., & Hennessy, S. (2006). Teachers' Developing 'Practical Theories' of the Contribution of Information and Communication Technologies to Subject Teaching and Learning: An Analysis of Cases from English Secondary Schools. *British Educational Research Journal*, 32(3), 459-480.
- Dede, C. (2008). Theoretical perspectives influencing the use of information technology in teaching and learning. *International handbook of information technology in primary and secondary education*, 43-62.
- Del Moral, M.E., Cernea, A., & Villalustre, L. (2013). Connectivist learning objects and learning styles. *Interdisciplinary Journal of E-Learning and Learning Objects*, 9, 105-124.

- Delanty, G. (2001). The university in the knowledge society. *Organization*, 8(2), 149-153.
- Denscombe, M. (2007). *Good research guide: for small-scale social research*. UK: Open University Press, McGraw Hill.
- Denzin, N.K., & Lincoln, Y.S. (2008). *Collecting and interpreting qualitative materials* (Vol. 3). London: Sage.
- Denzin, N.K., & Lincoln, Y.S. (2011). *The SAGE handbook of qualitative research*. London: Sage.
- Donalek, J.G. (2005). The interview in qualitative research. *Urologic Nursing*, 25(2), 124.
- Donnelly, D., McGarr, O., & O'Reilly, J. (2011). A framework for teachers' integration of ICT into their classroom practice. *Computers & Education*, 57(2), 1469-1483.
doi:10.1016/j.compedu.2011.02.014
- Downes, S. (2007). Learning networks in practice. In D. Ley (Ed.), *Emerging Technologies for Learning*. Canada: National Research Council of Canada.
- Draper, K. (2010). *Understanding science teachers' use and integration of ICT in a developing country context*. PhD Thesis, University of Pretoria.
- Dunn, K., & Rakes, G. (2010). Learner-centeredness and teacher efficacy: Predicting teachers' consequence concerns regarding? the use of technology in the classroom? *Journal of Technology and teacher education*, 18(1), 57-83.
- Dutton, W.H., Cheong, P.H., & Park, N. (2004). The social shaping of a virtual learning environment: The case of a university-wide course management system. *Electronic Journal of e-learning*, 2(1), 69-80.
- Edwards, S., & Bone, J. (2012). Integrating peer assisted learning and eLearning: Using innovative pedagogies to support learning and teaching in higher education settings. *Australian Journal of Teacher Education (Online)*, 37(5), 1.
- Ertmer, P.A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development*, 53(4), 25-39.
- Ertmer, P.A., Ottenbreit-Leftwich, A.T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), 423-435.
doi:<http://dx.doi.org/10.1016/j.compedu.2012.02.001>

- Ertmer, P.A., Ottenbreit-Leftwich, A.T., & Tondeur, J. (2014). Teachers' beliefs and uses of technology to support 21st-century teaching and learning. In: *International handbook of research on teacher beliefs*. Abingdon, UK: Routledge.
- Eynon, R. (2008). The use of the world wide web in learning and teaching in higher education: reality and rhetoric. *Innovations in Education and Teaching International*, 45(1), 15-23.
- Faggiano, E., & Fasano, M. (2004). Teacher's Perceptions and Use of ICTs: An Issue for Educators to deal with. Available from Tsg.icmell.org/document/get/229
- Fairfield, P. (2016). *Teachability and Learnability: Can Thinking be Taught?* UK: Taylor & Francis.
- Falconer, I., & Littlejohn, A. (2007). Designing for blended learning, sharing and reuse. *Journal of Further and Higher Education*, 31(1), 41-52.
doi:10.1080/03098770601167914
- Fanghanel, J. (2007). Investigating university lecturers' pedagogical constructs in the working context. *The Higher Education Academy*, 2007.
- Farrell, G. (2007). Survey of ICT and education in Africa: Uganda country report. In: *InfoDev ICT and Education Series*. Washington, DC: World Bank. Available from <https://openknowledge.worldbank.org/handle/10986/10655>
- Fernando, M. (2012). *Integration of ICT Technologies to Enhance the Quality in Faculties of Humanities and Social Sciences in Sri Lankan Universities*. Paper presented at the Annual research Symposium 2012, University of Colombo.
- Fillion, G., Ekiona, J., & Booto, P. (2012). Integrating ict into higher education at the university of moncton: a study of onsite vs online students'perceptions. *Academy of Educational Leadership Journal*, 16(4).
- Findik, D., & Ozkan, S. (2013). A model for instructors' adoption of learning management systems: Empirical validation in Higher Education context. *TOJET: The Turkish Online Journal of Educational Technology*, 12(2).
- Fischer, C.T. (2009). Bracketing in qualitative research: Conceptual and practical matters. *Psychotherapy Research*, 19(4-5), 583-590.

- Florida, R., Mellander, C., & Stolarick, K. (2008). Inside the black box of regional development—human capital, the creative class and tolerance. *Journal of economic geography*, 8(5), 615-649.
- Fong, R.W.T., Lee, J.C.K., Chang, C.Y., Zhang, Z., Ngai, A.C.Y., & Lim, C.P. (2014). Digital teaching portfolio in higher education: Examining colleagues' perceptions to inform implementation strategies. *The Internet and Higher Education*, 20, 60-68.
- Fontana, A., & Frey, J. (2005). *The interview: From neutral stance to political involvement*. (Vol. 3rd ed). London & Thousand Oaks, CA: Sage publications.
- Forcier, R.C., & Descy, D.E. (2007). *The computer as an educational tool: Productivity and problem solving*. Upper Saddle River, NJ: Prentice-Hall, Inc.
- Fosnot, C.T., & Perry, R.S. (1996). Constructivism: A psychological theory of learning. *Constructivism: Theory, perspectives, and practice*, 2, 8-33.
- Fossey, E., Harvey, C., McDermott, F., & Davidson, L. (2002). Understanding and evaluating qualitative research*. *Australian and New Zealand journal of psychiatry*, 36(6), 717-732.
- Fry, N., & Love, N. (2011). Business lecturers' perceptions and interactions with the virtual learning environment. *The international journal of management education*, 9(4), 51.
- Fullan, M. (2002). The change. *Educational leadership*, 59(8), 16-20.
- Gaffar, K., Singh, L., & Thomas, T. (2011). Are we ready for Web 2.0? Evidence from a Caribbean University. *The Caribbean Teaching Scholar*, 1(2).
- Gakio, K. (2006). *African tertiary institutions connectivity survey (ATICS)*. Report Commissioned by the International Development Research Centre (IDRC). Available from http://ahero.uwc.ac.za/index.php?module=cshe&action=viewtitle&id=cshe_172
- Garrett, R. (2003). The observatory on borderless higher education. *New review of information networking*, 9(1), 113-122.
- Garrote, R., & Pettersson, T. (2007). Lecturers' attitudes about the use of learning management systems in engineering education: A Swedish case study. *Australasian Journal of Educational Technology*, 23(3).
- Gautreau, C. (2011). Motivational factors affecting the integration of a learning management system by faculty. *Journal of Educators Online*, 8(1), n1.

- Georgina, D., & Olson, M. (2008). Integration of technology in higher education: A review of faculty self-perceptions. *The Internet and Higher Education*, 11(1), 1-8. doi:10.1016/j.iheduc.2007.11.002
- Georgina, D.A., & Hosford, C.C. (2009). Higher education faculty perceptions on technology integration and training. *Teaching and Teacher Education*, 25(5), 690-696.
- Gerring, J. (2004). What is a case study and what is it good for? *American political science review*, 98(2), 341-354.
- Giacomini, M.K., Cook, D.J., & Group, E.B.M.W. (2000). Users' guides to the medical literature: XXIII. Qualitative research in health care A. Are the results of the study valid? *Jama*, 284(3), 357-362.
- Glaser, B., & Strauss, A. (1967). *The discovery grounded theory: strategies for qualitative inquiry*. Chicago: Aldin.
- Glesne, C. (2006). Making words fly: Developing understanding through interviewing. *Becoming qualitative researchers: An introduction*, 79-108.
- Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report*, 8(4), 597-606.
- Goldie, J.G.S. (2016). Connectivism: A knowledge learning theory for the digital age? *Medical teacher*, 38(10), 1064-1069.
- Govender, D.W., & Dhurup, M. (2014). Perceptions of Learners of a Learning Management System to Support Teaching and Learning Using the Diffusion of Innovation Theory. *Mediterranean Journal of Social Sciences*, 5(8), 377.
- Green, K.C. (2001). *Campus Computing, 2000: The 11th National Survey of Computing and Information Technology in American Higher Education*. ERIC. Available from <https://eric.ed.gov/?id=ED451744>
- Green, W., & Myatt, P. (2011). Telling tales: A narrative research study of the experiences of new international academic staff at an Australian university. *International Journal for Academic Development*, 16(1), 33-44.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of Innovations in Service Organizations: Systematic Review and Recommendations. *Milbank Quarterly*, 82(4), 581-629. doi:10.1111/j.0887-378X.2004.00325.x

Greenhow, C., & Lewin, C. (2016). Social media and education: reconceptualizing the boundaries of formal and informal learning. *Learning, media and technology*, 41(1), 6-30.

Greenhow, C., & Robelia, B. (2009). Informal learning and identity formation in online social networks. *Learning, media and technology*, 34(2), 119-140. doi:10.1080/17439880902923580

Grove, S., & Burns, N. (2005). The Practice of Nursing Research: Conduct, Critique, & Utilization. Philadelphia: Saunders.

Gu, X., Zhu, Y., & Guo, X. (2013). Meeting the "digital natives": Understanding the acceptance of technology in classrooms. *Journal of Educational Technology & Society*, 16(1), 392.

Guillemain, M., & Gillam, L. (2004). Ethics, reflexivity, and "ethically important moments" in research. *Qualitative inquiry*, 10(2), 261-280.

Gulbahar, Y. (2008). ICT Usage in Higher Education: A Case Study on Preservice Teacher and Instructions. *Online Submission*, 7(1).

Gülbahar, Y. (2007). Technology planning: A roadmap to successful technology integration in schools. *Computers & Education*, 49(4), 943-956.

Gumpert, P.J. (2000). Academic restructuring: Organizational change and institutional imperatives. *Higher education*, 39(1), 67-91.

Guri-Rosenblit, S. (2005). 'Distance education' and 'e-learning': Not the same thing. *Higher education*, 49(4), 467-493. doi:10.1007/s10734-004-0040-0

Guri-Rosenblit, S., Šebková, H., & Teichler, U. (2007). Massification and diversity of higher education systems: Interplay of complex dimensions. *Higher Education Policy*, 20(4), 373-389.

Haddad, W.D. (2003). Is instructional technology a must for learning. *TechKnowLogia, January-March*, 5-6.

Halai, A. (2006). Ethics in qualitative research: Issues and challenges. *EdQual A Research Programme Consortium on Implementing Education Quality in Low Income Countries. EdQual Working Paper Number*, 4, 1-12.

Halbach, A. (1999). Using trainee diaries to evaluate a teacher training course. *ELT Journal*, 53(3), 183-189.

Hamilton, E., & Feenberg, A. (2005). The technical codes of online education. *E-Learning and Digital Media*, 2(2), 104 - 121

Han, I., Eom, M., & Shin, W.S. (2013). Multimedia case-based learning to enhance pre-service teachers' knowledge integration for teaching with technologies. *Teaching and Teacher Education*, 34, 122-129.

Hanemann, U. (2015). Lifelong literacy: Some trends and issues in conceptualising and operationalising literacy from a lifelong learning perspective. *International Review of Education*, 61(3), 295-326. doi:10.1007/s11159-015-9490-0

Hariri, A., & Roberts, P. (2015). Adoption of Innovation within Universities: Proposing and Testing an Initial Model. *Creative Education*, 6(02), 186.

Harris, D.R. (2002). *In the eye of the beholder: Observed race and observer characteristics*. Population Studies Center Research Report (02-522).

Harris, J., Mishra, P., & Koehler, M. (2009). Teachers' technological pedagogical content knowledge and learning activity types: Curriculum-based technology integration reframed. *Journal of Research on Technology in Education*, 41(4), 393-416.

Hatch, J.A. (2002). *Doing qualitative research in education settings*. Albany, NY: Suny Press.

Hawawini, G. (2005). The future of business schools. *Journal of Management Development*, 24(9), 770-782.

Hawkins, R. (2002). *Ten lessons for ICT and education in the developing world*. World Links for Development Program, The World Bank Institute. Available from http://ftp.unpad.ac.id/orari/library/library-ref-eng/ref-eng-3/application/education/gitrr2002_ch04.pdf

Hawkridge, D. (1990). Who needs computers in schools, and why? *Computers & Education*, 15(1), 1-6.

Henkel, M. (2005). Academic identity and autonomy in a changing policy environment. *Higher education*, 49(1-2), 155-176.

Hennessy, S. (2006). Integrating technology into teaching and learning of school science: a situated perspective on pedagogical issues in research. *Studies in Science Education*, 42, 1-48.

- Hennessy, S., Ruthven, K., & Brindley, S.U.E. (2005). Teacher perspectives on integrating ICT into subject teaching: commitment, constraints, caution, and change. *Journal of curriculum Studies*, 37(2), 155-192. doi:10.1080/0022027032000276961
- Hennessy, S., Wishart, J., Whitelock, D., Deaney, R., Brawn, R., la Velle, L., McFarlane, A., Ruthven, K., & Winterbottom, M. (2007). Pedagogical approaches for technology-integrated science teaching. *Computers & Education*, 48(1), 137-152.
- Henning, E., & van Rensburg, W.S. (2004). Finding your way in qualitative research. Pretoria: Van Schaik Publishers.
- Henwood, K. (2014). Qualitative Research. In T. Teo (Ed.), *Encyclopedia of Critical Psychology* (pp. 1611-1614). New York, NY: Springer New York.
- Hicks, S.D. (2011). Technology in today's classroom: Are you a tech-savvy teacher? *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 84(5), 188-191.
- Hill, C.E., Thompson, B.J., & Williams, E.N. (1997). A guide to conducting consensual qualitative research. *The counseling psychologist*, 25(4), 517-572.
- Hoerup, S.L. (2001). *Diffusion of an innovation: Computer technology integration and the role of collaboration*. Virginia: Virginia Tech.
- Holden, H., & Rada, R. (2011). Understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance. *Journal of Research on Technology in Education*, 43(4), 343-367.
- Holloway, I., & Galvin, K. (2016). *Qualitative research in nursing and healthcare*. Hoboken, NJ: John Wiley & Sons.
- Holloway, I., & Wheeler, S. (1996). Qualitative research for nursesBlackwell Science. UK: Oxford press.
- Holly, M.L. (1989). Reflective writing and the spirit of inquiry. *Cambridge Journal of Education*, 19(1), 71-80.
- Holm-Nielsen, L.B. (2001). *Challenges for higher education systems*. Paper presented at the International Conference on Higher Education, Jakarta, August.
- Hong, K.S., & Songan, P. (2011). ICT in the changing landscape of higher education in Southeast Asia. *Australasian Journal of Educational Technology*, 27(8), 1276-1290.
- Hopkins, D. (2014). *A teacher's guide to classroom research*. UK: McGraw-Hill Education.

Horsburgh, D. (2003). Evaluation of qualitative research. *Journal of clinical nursing*, 12(2), 307-312.

Hossain, M.M., & Quinn, R.J. (2012). Advantages and disadvantages of using a blogging activity in a college Euclidean geometry course. *International Journal of Computer Technology and Electronics Engineering*, 2(6), 1-8.

Howe, E.L., & Kekwaletswe, R.M. (2012). Personalized Learning Support Through Web 2.0: A South African Context. *i-Manager's Journal of Educational Technology*, 8(4), 42.

Howie, S.J. (2010). ICT supported pedagogical policies and practices in South Africa and Chile: emerging economies and realities. *Journal of Computer Assisted Learning*, 26(6), 507-522.

Hoyle, R.H., Harris, M.J., & Judd, C.M. (2002). *Research methods in social relations*. USA: Thomson Learning.

Hsieh, H.F., & Shannon, S.E. (2005). Three approaches to qualitative content analysis. *Qualitative health research*, 15(9), 1277-1288.

Hu, L., & Webb, M. (2009). Integrating ICT to higher education in China: From the perspective of Activity Theory. *Education and Information Technologies*, 14(2), 143-161.

Hung, H.T., & Yuen, S.C.Y. (2010). Educational use of social networking technology in higher education. *Teaching in Higher Education*, 15(6), 703-714.
doi:10.1080/13562517.2010.507307

Ingutia-Oyieke, L., & Dick, A.L. (2010). A comparative analysis of the use of electronic resources by undergraduate students at two Kenyan universities. *Unisa Press Mousaion*, 28(2), 64–81.

Irwin, C., Ball, L., Desbrow, B., & Leveritt, M. (2012). Students' perceptions of using Facebook as an interactive learning resource at university. *Australasian Journal of Educational Technology*, 28(7).

Jackson, R.L., Drummond, D.K., & Camara, S. (2007). What is qualitative research? *Qualitative Research Reports in Communication*, 8(1), 21-28.

Jacobs, J.K., Kawanaka, T., & Stigler, J.W. (1999). Integrating qualitative and quantitative approaches to the analysis of video data on classroom teaching. *International Journal of Educational Research*, 31(8), 717-724.

Jacobsen, M. (2000). *Excellent teaching and early adopters of instructional technology*. Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications.

Jaggars, S.S., & Bailey, T. (2010). *Effectiveness of Fully Online Courses for College Students: Response to a Department of Education Meta-Analysis*. USA: Community College Research Center, Columbia University.

James, K., John, M., & Joseph, M.N. (2010). Performance management practices, information and communication technology (ICT) adoption and managed performance. *Quality Assurance in Education*, 18(2), 106-125.
doi:doi:10.1108/09684881011035330

Janesick, V.J. (1999). A journal about journal writing as a qualitative research technique: History, issues, and reflections. *Qualitative Inquiry*, 5(4), 505-524.

Jankowska, M.A. (2004). Identifying University Professors' Information Needs in the Challenging Environment of Information and Communication Technologies. *The Journal of Academic Librarianship*, 30(1), 51-66. doi:10.1016/j.jal.2003.11.007

Jayson, D. (2016). *Facebook Live: Everything You Need To Know*. Available from <https://www.forbes.com/sites/jaysondemers/2016/04/26/facebook-live-everything-you-need-to-know/>

Jenkins, M., Browne, T., Walker, R., & Hewitt, R. (2011). The development of technology enhanced learning: findings from a 2008 survey of UK higher education institutions. *Interactive Learning Environments*, 19(5), 447-465.

Jiahou, L. (2005). 2005 AECT Educational Technology Definition: Discussion and Critics. *Modern Distance Education*, 1, 002.

JISC. (2003). *The learning experience, Inclusive learning and teaching: ILT for disabled learners*. Becta and JISC TechDis Service. Retrieved from <http://sid.usal.es/idocs/F8/FDO25695/Theme1.1.pdf>

John, P.D., & Sutherland, R. (2004). Teaching and learning with ICT: new technology, new pedagogy? *Education, Communication & Information*, 4(1), 101-107.
doi:10.1080/1463631042000210971

John, S.P. (2015). *The Integration of Information Technology in Higher Education: A Study of Faculty's Attitude Towards its Adoption in the Teaching Process*. Paper presented at the

XIV International Business and Economy Conference (IBEC), Bangkok, Thailand.

<http://ssrn.com/abstract=2550007> or <http://dx.doi.org/10.2139/ssrn.2550007>

John W. Miller, L.P.M., and Clark, R.C. (2000). Technology Infusion and Higher Education: Changing Teaching and Learning. *Innovative Higher Education*, 24(3).

Johnson, L., Adams Becker, S., Estrada, V., & Freeman, A. (2015). *The NMC Horizon Report: 2015 Higher Education Edition*. Austin, Texas: The New Media Consortium. Available from <http://cdn.nmc.org/media/2015-nmc-horizon-report-HE-EN.pdf>

Jones, T.C., & Brackenridge, B. (2004). *Digital content distribution, transmission and protection system and method, and portable device for use therewith*. Google Patents. Available from <https://patents.google.com/patent/US6697944>

Joseph, L. (2007). *The adoption and diffusion of computing and Internet technologies in historically Black colleges and universities*. Minneapolis, USA: Walden University,

Junco, R., & Cotten, S.R. (2011). Perceived academic effects of instant messaging use. *Computers & Education*, 56(2), 370-378. doi:10.1016/j.compedu.2010.08.020

Justus, M. (2017). The Role of Pedagogical Beliefs in Emerging Technology Integration: An Exploratory Case Study of Faculty Perspectives. *The Qualitative Report*, 22(2), 499-526.

Karaseva, A., Siibak, A., & Pruulmann-Vengerfeldt, P. (2015). Relationships between teacherspedagogical beliefs, subject cultures, and mediation practices of students' use of digital technology. *Cyberpsychology: Journal of Psychosocial Research on Cyberspace*, 9(1).

Karmila, I. (2013). Mobile Learning for ICT Training: Enhancing ICT Skill of Teachers in Indonesia. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 3(4). doi:10.7763/ijeeee.2013.v3.243

Karsenti, T., & Fievez, A. (2013). The iPad in education: uses, benefits, and challenges. *A survey of*, 6057.

Kasozi , A.B. (2002). The role of the state in addressing challenges and opportunities posed by the rapid growth of universities in Uganda since 1988. *African studies review*, 45(02), 123-139.

Kasozi , A.B. (2008). The State of Higher Education and Training in Uganda: A Summary of Finding, Kampala. Uganda: National Council of Higher Education.

Keane, T., Keane, W.F., & Blicblau, A.S. (2016). Beyond traditional literacy: Learning and transformative practices using ICT. *Education and Information Technologies*, 21(4), 769-781.

Kearns, P & Global Learning Services Pty Ltd (Australia) & Australia. Dept of Education, Science and Training (DEST) (2002). Towards the connected learning society : an international overview of trends in policy for information and communication technology in education.

Keengwe, J., Onchwari, G., & Wachira, P. (2008). The use of computer tools to support meaningful learning. *AACE journal*, 16(1), 77-92.

Keller, C. (2005). Virtual learning environments: three implementation perspectives. *Learning, media and technology*, 30(3), 299-311.

Kember, D., & Kwan, K.P. (2000). Lecturers' approaches to teaching and their relationship to conceptions of good teaching. *Instructional science*, 28(5), 469-490.

Khasawneh, M., & Ibrahim, H. (2012). A model for Adoption of ICT in Jordanian Higher Education Institutions: An Empirical Study. *Journal of e-Learning & Higher Education*, 2012.

Khine, M.S., & Fisher, D. (2003). *Technology-rich learning environments: A future perspective*: World Scientific Publishing Co Inc.

Kim, P., Hagashi, T., Carillo, L., Gonzales, I., Makany, T., Lee, B., & Garate, A. (2011). Socioeconomic strata, mobile technology, and education: A comparative analysis. *Educational Technology Research and Development*, 59(4), 465-486.

Kirkwood, A. (2009). E learning: you don't always get what you hope for. *Technology, Pedagogy and Education*, 18(2), 107-121.

Kirkwood, A., & Price, L. (2013). Examining some assumptions and limitations of research on the effects of emerging technologies for teaching and learning in higher education. *British Journal of Educational Technology*, 44(4), 536-543.

Kirschner, P., Wubbels, T., & Brekelmans, M. (2008). Benchmarks for teacher education programs in the pedagogical use of ICT. In J. Voogt & G. Knezek (eds.), *International*

handbook of information technology in primary and secondary education (pp. 435-447). Berlin: Springer Science + Business Media

Kisla, T., Arikan, Y.D., & Sarsar, F. (2009). The investigation of the usage of ICT in university lecturers' courses. *Procedia - Social and Behavioral Sciences*, 1(1), 502-507. doi:10.1016/j.sbspro.2009.01.091

Knight, P., & Trowler, P. (2001). *Departmental leadership in higher education*. UK: McGraw-Hill Education.

Koch, T. (2006). Establishing rigour in qualitative research: the decision trail. *Journal of advanced nursing*, 53(1), 91-100.

Koehler, M., & Mishra, P. (2009). What is Technological Pedagogical Content Knowledge (TPACK)? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70.

Kopcha, T.J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers & Education*, 59(4), 1109-1121. doi:10.1016/j.compedu.2012.05.014

Kozma, R. B. (2008). Comparative analysis of policies for ICT in education. In In J. Voogt & G. Knezek (eds.), *International handbook of information technology in primary and secondary education* (pp. 1083-1096). Berlin: Springer Science + Business Media

Kramer, B.S., Walker, A.E., & Brill, J.M. (2007). The underutilization of information and communication technology-assisted collaborative project-based learning among international educators: A Delphi study. *Educational Technology Research and Development*, 55(5), 527-543.

Krauss, S.E. (2005). Research paradigms and meaning making: A primer. *The Qualitative Report*, 10(4), 758-770.

Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *American journal of occupational therapy*, 45(3), 214-222.

Krippendorff, K. (2012). *Content analysis: An introduction to its methodology*. London: Sage.

Kukulska-Hulme, A. (2012). How should the higher education workforce adapt to advancements in technology for teaching and learning? *The Internet and Higher Education*, 15(4), 247-254. doi:10.1016/j.iheduc.2011.12.002

- Kwabena Ayeh, J. (2008). Information Communications Technology and Global Education: the challenges of the African Virtual University Learning Centres in Ghana. *Information Development*, 24(4), 266-274. doi:10.1177/0266666908098070
- Lai, K.W. (2011). Digital technology and the culture of teaching and learning in higher education. *Australasian Journal of Educational Technology*, 27(8), 1263-1275.
- Lapan, S.D., Quartaroli, M.T., & Riemer, F.J. (2011). *Qualitative research: An introduction to methods and designs* (Vol. 37). Hoboken, NJ: John Wiley & Sons.
- Larsen, K., & Vincent-Lancrin, S. (2005). The impact of ICT on tertiary education: advances and promises. In D. Foray & B. Kahin (eds.), *Advancing Knowledge and the Knowledge Economy*. Cambridge, Massachusetts: MIT Press.
- Lau, F., & Bates, J. (2004). A review of e-learning practices for undergraduate medical education. *Journal of Medical Systems*, 28(1), 71-87.
- Law, N., Lee, M.W., & Chan, A. (2010). Policy impacts on pedagogical practice and ICT use: an exploration of the results from SITES 2006. *Journal of Computer Assisted Learning*, 26(6), 465-477.
- Law, N., Pelgrum, W.J., & Plomp, T. (2008). *Pedagogy and ICT use in schools around the world: Findings from the IEA SITES 2006 study* (Vol. 23). NY: Springer Science & Business Media.
- Law, N., Yuen, A., & Fox, R. (2011). An Ecological Metaphor for Researching Technology Use and Pedagogical Innovations. In *Educational Innovations Beyond Technology* (pp. 1-13). Boston, MA: Springer.
- Lee, M.J., & McLoughlin, C. (2007). Teaching and learning in the Web 2.0 era: Empowering students through learner-generated content. *International journal of instructional technology and distance learning*, 4(10), 21-34.
- Leech, B.L. (2002). Asking questions: techniques for semistructured interviews. *Political Science & Politics*, 35(04), 665-668.
- Less, K.H. (2003). *Faculty Adoption of Computer Technology for Instruction in the North Carolina Community College System*. Electronic Theses and Dissertations, Paper 782. Available from <http://dc.etsu.edu/etd/782>

Letseka, M., & Pitsoe, V. (2013). The challenges and prospects of access to higher education at UNISA. *Studies in Higher Education*, 39(10), 1942-1954. DOI: 10.1080/03075079.2013.823933

Lewis, P., Thornhill, A., & Saunders, M. (2007). *Research methods for business students*. UK: Pearson Education.

Lim, C.P. (2007). Effective integration of ICT in Singapore schools: Pedagogical and policy implications. *Educational Technology Research and Development*, 55(1), 83-116.

Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry* (Vol. 75). London: Sage.

Lindblom Ylänné, S., Trigwell, K., Nevgi, A., & Ashwin, P. (2006). How approaches to teaching are affected by discipline and teaching context. *Studies in Higher Education*, 31(3), 285-298. doi:10.1080/03075070600680539

Lindsay, K. (2006). *Connecting technology and university teaching*. Paper presented at the International Conference on Multimedia and Information and Communication Technologies in Education.

Linn, M.C., & Eylon, B.S. (2011). *Science learning and instruction: Taking advantage of technology to promote knowledge integration*. UK: Routledge.

Littlejohn, A.H. (2002). Improving continuing professional development in the use of ICT. *Journal of Computer Assisted Learning*, 18(2), 166-174. doi:10.1046/j.0266-4909.2001.00224.x

Lloyd, M.M. (2005). *Towards a definition of the integration of ICT in the classroom*. Australian Association for Research in Education. Available from <https://www.aare.edu.au/publications-database.php/4779/Towards-a-definition-of-the-integration-of-ICT-in-the-classroom>

Lock, S., Wells, F.O., & Farthing, M.J. (2001). *Fraud and misconduct in biomedical research*. London: BMJ Publishing Group.

Löfström, E., & Nevgi, A. (2007). From strategic planning to meaningful learning: diverse perspectives on the development of web based teaching and learning in higher education. *British Journal of Educational Technology*, 38(2), 312-324.

Lonn, S., & Teasley, S.D. (2009). Saving time or innovating practice: Investigating perceptions and uses of Learning Management Systems. *Computers & Education*, 53(3), 686-694.

- López-Pérez, M., Pérez-López, M.C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education*, 56(3), 818-826.
- Loveless, A. (2007). Preparing to teach with ICT: subject knowledge, Didaktik and improvisation. *The Curriculum Journal*, 18(4), 509-522.
- Lwoga, E. (2012). Making learning and Web 2.0 technologies work for higher learning institutions in Africa. *Campus-Wide Information Systems*, 29(2), 90-107.
- Lytras, M.D., Mathkour, H., Abdalla, H.I., Yáñez-Márquez, C., & De Pablos, P.O. (2014). The Social Media in Academia and EducationResearch R-evolutions and a Paradox: Advanced Next Generation Social Learning Innovation. *J. Universal Computer Science*, 20(15), 1987-1994.
- MacKeogh, K., & Fox, S. (2008). *Strategies for embedding eLearning in traditional universities: drivers and barriers*. In: ECEL 2008 - The Proceedings of the 7th European Conference on e-Learning, 6-7 November 2008, Agia Napa, Cyprus. ISBN 978-1-906638-23-8
- Makrakis, V. (2005). *Training teachers for new roles in the new era: Experiences from the United Arab Emirates ICT program*. Paper presented at the Proceedings of the 3rd Pan-Hellenic Conference on Didactics of Informatics.
- Maleko Munguatosha, G., Birevu Muyinda, P., & Thaddeus Lubega, J. (2011). A social networked learning adoption model for higher education institutions in developing countries. *On the Horizon*, 19(4), 307-320.
- Malterud, K. (2012). Systematic text condensation: A strategy for qualitative analysis. *Scandinavian Journal of Public Health*, 40(8), 795-805.
doi:10.1177/1403494812465030
- Mannan, S., & Nordin, S.M. (2014). The Influence of Innovation Attributes on New Technologies Adoption by Paddy Farmers. *International Review of Management and Business Research*, 3(3), 1379.
- Manning, K. (1997). Authenticity in constructivist inquiry: Methodological considerations without prescription. *Qualitative inquiry*, 3(1), 93-115.
- Marcelo, C. (2009). Professional Development of Teachers: past and future. *Educational Sciences Journal*, 8, 5-20.

Mariya, M. (2014). A Model of Leadership in Integrating Educational Technology in Higher Education. *Online Journal of Distance Learning Administration, XVII(IV)*.

Martins, C.B., Steil, A.V., & Todesco, J.L. (2004). Factors influencing the adoption of the Internet as a teaching tool at foreign language schools. *Computers & Education, 42*(4), 353-374.

Maxwell, J.A. (2012). *Qualitative research design: An interactive approach* (Vol. 41). London:Sage publications.

Maykut, P., & Morehouse, R. (1994). Beginning qualitative research: a philosophic and practical approach. London: The Falmer Press.

Mazman, S.G., & Usluel, Y.K. (2010). Modeling educational usage of Facebook. *Computers & Education, 55*(2), 444-453.

McCarthy, J. (2010). Blended learning environments: Using social networking sites to enhance the first year experience. *Australasian Journal of Educational Technology, 26*(6).

McCombs, B.L. (2000). *Assessing the Role of Educational Technology in the Teaching and Learning Process: A Learner-Centered Perspective*. ERIC. Available from <https://files.eric.ed.gov/fulltext/ED452830.pdf>

McElroy, J., & Blount, Y. (2006). You, me and iLecture. *Who's Learning, 549-558*.

McGarr, O. (2009). A review of podcasting in higher education: Its influence on the traditional lecture. *Australasian Journal of Educational Technology, 25*(3).

McLellan, E., MacQueen, K.M., & Neidig, J.L. (2003). Beyond the qualitative interview: Data preparation and transcription. *Field methods, 15*(1), 63-84.

McLoughlin, C., & Lee, M.J. (2007). *Social software and participatory learning: Pedagogical choices with technology affordances in the Web 2.0 era*. Paper presented at the ICT: Providing choices for learners and learning. Proceedings asciilite Singapore 2007.

McLoughlin, C., & Lee, M.J. (2010). Personalised and self regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology, 26*(1).

McPhee, I., & Söderström, T. (2012). Distance, online and campus higher education: reflections on learning outcomes. *Campus-Wide Information Systems, 29*(3), 144-155.

Medun, B.D. (2001). *The factors that may influence a faculty members' decision to adopt electronic technologies in instruction*. PhD thesis. Virginia Polytechnic Institute and State University, USA.

Mehra, P., & Mital, M. (2007). Integrating technology into the teaching-learning transaction: Pedagogical and technological perceptions of management faculty. *International Journal of Education and Development using Information and Communication Technology*, 3(1), 105.

Menkhoff, T., Chay, Y.W., Bengtsson, M.L., Woodard, C.J., & Gan, B. (2015). Incorporating microblogging ("tweeting") in higher education: Lessons learnt in a knowledge management course. *Computers in Human Behavior*, 51, 1295-1302.

Merriam, S.B. (1998). *Qualitative Research and Case Study Applications in Education. Revised and Expanded from "Case Study Research in Education."* ERIC.

Mertens, D.M. (2014). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. London: Sage publications.

Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook*. London: Sage.

Mishra, P., & Kereluik, K. (2011). *What 21st century learning? A review and a synthesis*. Paper presented at the Proceedings of Society for Information Technology & Teacher Education International Conference.

Mishra, P., & Koehler, M.J. (2007). Technological pedagogical content knowledge (TPCK): Confronting the wicked problems of teaching with technology. *Technology and Teacher Education Annual*, 18(4), 2214.

Mishra, P., Koehler, M.J., & Henriksen, D. (2010). The 7 transdisciplinary habits of mind: Extending the TPACK framework towards 21st century learning. *Educational Technology*, 51(2), 22-28.

Moe, M.T., Blodget, H., Lynch, M., & Lynch, M. (2000). *The knowledge web: People power, fuel for the new economy*. Merrill Lynch & Company Global Securities Research & Economics Group, Global Fundamental Equity Research Department. Available from https://www.immagic.com/eLibrary/ARCHIVES/GENERAL/GSVA_US/M000523K.pdf

- Monahan, T. (2008). Picturing technological change: the materiality of information infrastructures in public education. *Technology, Pedagogy and Education, 17*(2), 89-101.
- Montrieux, H., Vanderlinde, R., Schellens, T., & De Marez, L. (2015). Teaching and learning with mobile technology: A qualitative explorative study about the introduction of tablet devices in secondary education. *PLoS one, 10*(12), e0144008.
- Moran, M., Seaman, J., & Tinti-Kane, H. (2011). *Teaching, Learning, and Sharing: How Today's Higher Education Faculty Use Social Media*. Wellesley, Boston, San Francisco, Miami: Babson Survey Research Group.
- Mtebe, J.S., Mbwilo, B., & Kissaka, M.M. (2016). Factors influencing teachers' use of multimedia enhanced content in secondary schools in Tanzania. *The International Review of Research in Open and Distributed Learning, 17*(2).
- Mueller, J., Wood, E., Willoughby, T., Ross, C., & Specht, J. (2008). Identifying discriminating variables between teachers who fully integrate computers and teachers with limited integration. *Computers & Education, 51*(4), 1523-1537.
- Mulhall, A. (2003). In the field: notes on observation in qualitative research. *Journal of advanced nursing, 41*(3), 306-313.
- Mumtaz, S. (2000a). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of Information Technology for Teacher Education, 9*(3), 319-342. doi:10.1080/14759390000200096
- Mumtaz, S. (2000b). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of Information Techology for Teacher Education, 9*(3), 319-342. doi:10.1080/14759390000200096
- Mumtaz, S. (2006). Factors affecting teachers' use of information and communications technology: a review of the literature. *Journal of Information Technology for Teacher Education, 9*(3), 319-342., doi:10.1080/14759390000200096
- Murray, K.E., & Waller, R. (2007). Social networking goes abroad. *International Educator, 16*(3), 56.
- Mutonyi, H., & Norton, B. (2007). ICT on the margins: Lessons for Ugandan education. *Language and Education, 21*(3), 264-270.

Mutula, S.M. (2013). Ethical Dimension of the Information Society: implications for Africa. *Information Ethics in Africa: Cross-Cutting Themes*, Pretoria: AC, 29-42.

Muzaki, F., & Mugisa, E. (2006). Towards enhancing learning with information and communication technology in universities. *Measuring computing research excellence and vitality*, 15.

Myers, M.D. (2013). *Qualitative research in business and management*. Thousand Oaks, CA: Sage.

NCHE. (2010). *The state of higher Education and training in Uganda, A report on higher education delivery and institutions*. Kyambogo, Kampala: The National Council for Higher Education.

NCHE. (2013). *The state of higher educationand training in Uganda: A Report on higher education delivery and institutions*. Available from <http://www.unche.or.ug/publications/state-of-he/state-of-higher-education.html>

Ndawula Stephen, K.B.J., Mwebembezi, J., & Masagazi, J.Y. (2013). Getting Schools Ready for Integration of Pedagogical ICT: the Experience of Secondary Schools in Uganda. *International Journal of Academic Research in Business and Social Sciences*, 3(2).

Neuman, W.L., & Kreuger, L. (2003). *Social work research methods: Qualitative and quantitative approaches*. Boston, Massachusetts: Allyn and Bacon.

Neyland, E. (2011). Integrating online learning in NSW secondary schools: Three schools' perspectives on ICT adoption. *Australasian Journal of Educational Technology*, 27(1).

Nguyen, N., Williams, J., Nguyen, T., & Model, T. (2012). *The use of ICT in teaching tertiary physics: Technology and pedagogy*. Paper presented at the Asia-Pacific Forum on Science Learning and Teaching.

Njenga, J.K., & Fourie, L.C.H. (2010). The myths about e learning in higher education. *British Journal of Educational Technology*, 41(2), 199-212.

Nnazor, R. (2009). A Conceptual Framework for Understanding Use of Information and Communication Technology in Teaching in Universities. *International Journal of Instructional Technology & Distance Learning*, 6(1), 47-58.

Ntemana, T.J., & Olatokun, W. (2012). Analyzing the Influence of Diffusion of Innovation Attributes on Lecturers? Attitudes Toward Information and Communication

Technologies. *Human Technology: An Interdisciplinary Journal on Humans in ICT Environments*, 8(2), 179-197.

Nyirongo, N.K. (2009). *Technology adoption and integration: A descriptive study of a higher education institution in a developing nation*. Virginia: Virginia Tech.

Odabasi, H.F. (2000). Faculty use of technological resources in Turkey. *Innovations in Education and Teaching International*, 37(2), 103-107.

Oliver, R. (2002). *The role of ICT in higher education for the 21st century: ICT as a change agent for education*. Available from
https://www.researchgate.net/publication/228920282_The_role_of_ICT_in_higher_education_for_the_21st_century_ICT_as_a_change_agent_for_education

Ondieki Makori, E. (2012). Bridging the information gap with the patrons in university libraries in Africa: the case for investments in Web 2.0 systems. *Library Review*, 61(1), 30-40.

Opati, O.D. (2013). *The Use of ICT in Teaching and Learning at Makerere University: The Case of College of Education and External Studies*. Oslo: University of Oslo. Available from <https://www.duo.uio.no/handle/10852/36807>

Osorio, L., Cifuentes, G., & Rey, G. (2011). ICT incorporation in higher education: e-maturity in the PlanEsTIC Project. *Educación para el siglo XXI: Aportes del Centro de Investigación y Formación en Educación*, 2.

Ottenbreit-Leftwich, A. T., Glazewski, K. D., Newby, T. J., & Ertmer, P. A. (2010). Teacher value beliefs associated with using technology: Addressing professional and student needs. *Computers & Education*, 55(3), 1321-1335.
doi:10.1016/j.compedu.2010.06.002

Ottestad, G. (2010). Innovative pedagogical practice with ICT in three Nordic countries—differences and similarities. *Journal of Computer Assisted Learning*, 26(6), 478-491.

Pankaja, N., & Mukund Raj, P. (2013). Proprietary software versus open source software for education. *American Journal of Engineering Research*, 2(7), 124-130.

Parker, K., Lenhart, A., & Moore, K. (2011). The Digital Revolution and Higher Education: College Presidents, Public Differ on Value of Online Learning. *Pew Internet & American Life Project*.

Patton, M.Q. (1990). *Qualitative evaluation and research methods*. Thousand Oaks, CA: SAGE Publications, inc.

Patton, M.Q. (2002). *Qualitative research and evaluation methods* (3rd ed.): Thousand Oaks, CA: Sage.

Patzer, S.M. (2010). *The Ohio Learning Network and the diffusion of technology to higher education (1999-2008)*. Minneapolis: Walden University,

Pelgrum, W.J. (2001). Obstacles to the integration of ICT in education: results from a worldwide educational assessment. *Computers & Education*, 37(2), 163-178.

Peräkylä, A. (2008). Analyzing talk and text. *Collecting and interpreting qualitative materials*, 3, 351-374.

Peters, M. (2009). National education policy constructions of the ‘knowledge economy’: towards a critique. *The Journal of Educational Enquiry*, 2(1).

Pheeraphan, N. (2013). Enhancement of the 21st century skills for Thai higher education by integration of ICT in classroom. *Procedia-Social and Behavioral Sciences*, 103, 365-373.

Phillips, R. (2005). Challenging the primacy of lectures: The dissonance between theory and practice in university teaching. *Journal of University Teaching & Learning Practice*, 2(1), 2.

Pickard, A.J. (2007). Research methods in information. *Library and Information Research*, 32(102), 61-62.

Plomp, T., Anderson, R.E., Law, N., & Quale, A. (2009). *Cross-National Information and Communication Technology Policies and Practices in Education* (Revised Second Edition). IAP. Available from <http://www.infoagepub.com/products/Cross-National-Information-and-Communication-Technology-Policies>

Plomp, T., & Pelgrum, W.J. (1993). Restructuring of schools as a consequence of computer use? *International Journal of Educational Research*, 19(2), 185-195.

Plomp, T., & Voogt, J. (2009). Pedagogical practices and ICT use around the world: Findings from the IEA international comparative study SITES2006. *Education and Information Technologies*, 14(4), 285-292. doi:10.1007/s10639-009-9090-3

- Poirot, J.L. (2009). *An investigation of factors affecting omani faculty members'adoption of information and computing technology*. USA: University of North Texas,
- Polit, D.F., & Beck, C.T. (2008). *Nursing research: Generating and assessing evidence for nursing practice*. Philadelphia, Pennsylvania: Lippincott Williams & Wilkins.
- Polit, D.F., & Beck, C.T. (2009). International differences in nursing research, 2005–2006. *Journal of Nursing Scholarship*, 41(1), 44-53.
- Polkinghorne, D.E. (2005). Language and meaning: Data collection in qualitative research. *Journal of counseling psychology*, 52(2), 137.
- Pope, C., Mays, N. (2006). Qualitative methods in health research. *methods*, 1, 2. Retrieved from
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.456.9024&rep=rep1&type=pdf>
- Pope, C., Ziebland, S., & Mays, N. (2006). Analysing qualitative data. *Qualitative research in health care*, 3.
- Porter, W.W., Graham, C.R., Spring, K.A., & Welch, K.R. (2014). Blended learning in higher education: Institutional adoption and implementation. *Computers & Education*, 75, 185-195.
- Pratt, M.G. (2009). From the editors: For the lack of a boilerplate: Tips on writing up (and reviewing) qualitative research. *Academy of Management Journal*, 52(5), 856-862.
- Prensky, M. (2001). Digital Natives, Digital Immigrants Part 1. *On the Horizon*, 9(5), 1-6.
doi:10.1108/10748120110424816
- Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment (CIE)*, 1(1), 21-21.
- Prescott, J. (2014). Teaching style and attitudes towards Facebook as an educational tool. *Active Learning in Higher Education*, 15(2), 117-128.
- Preston, G., Phillips, R., Gosper, M., McNeill, M., Woo, K., & Green, D. (2010). Web-based lecture technologies: Highlighting the changing nature of teaching and learning. *Australasian Journal of Educational Technology*, 26(6), 717-728.

Price, L., & Kirkwood, A. (2013). Using technology for teaching and learning in higher education: a critical review of the role of evidence in informing practice. *Higher Education Research & Development*, 33(3), 549-564.
doi:10.1080/07294360.2013.841643

Price, S. (2005). *Review of the impact of technology-enhanced learning on roles and practices in Higher Education*. Kaleidoscope Deliverable 30.2.1. Available from <https://pdfs.semanticscholar.org/369b/4a902a77f75783f9b1100cfe25468931c1cc.pdf>

Rampersad, C.A. (2011). *Teachers' perceptions of the contribution of information and communication technology to the teaching of modern studies, using an integrated system, in an urban secondary school*. The West Indies: The University of the West Indies.

Randolph, J.J. (2007). *Multidisciplinary methods in educational technology research and development*. HAMK Press/Justus Randolph.

Raphael, C., & Mtebe, J.S. (2017). Pre-Service Teachers' Self-Efficacy Beliefs Towards Educational Technologies Integration in Tanzania. *Journal of Learning for Development-JL4D*, 4(2).

Raskin, J.D. (2002). Constructivism in psychology: Personal construct psychology, radical constructivism, and social constructionism. *American communication journal*, 5(3), 1-25.

Rasul, S., Bukhsh, Q., & Batool, S. (2011). A study to analyze the effectiveness of audio visual aids in teaching learning process at uvniversity level. *Procedia-Social and Behavioral Sciences*, 28, 78-81.

Redmond, P. (2011). *From face-to-face teaching to online teaching: Pedagogical transitions*. Paper presented at the Proceedings ASCILITE 2011: 28th Annual Conference of the Australasian Society for Computers in Learning in Tertiary Education: Changing Demands, Changing Directions.

Reffell, P., & Whitworth, A. (2002). Information fluency: critically examining IT education. *New Library World*, 103(11/12), 427-435.

Reid, S. (2002). The integration of information and communication technology into classroom teaching. *Alberta journal of educational research*, 48(1), 30-46.

- Rena, R. (2010). Emerging Trends of Higher Education in Developing Countries. *Analele Stiintifice ale Universitatii "Alexandru Ioan Cuza" din Iasi-Stiinte Economice, 2010*, 301-316.
- Renata Phelps, A.G. (2008). Developing technology together, together: a whole- school metacognitive approach to ICT teacher professional development. *Journal of Computing in Teacher Education*.
- Richards, C. (2004). From old to new learning: global imperatives, exemplary Asian dilemmas and ICT as a key to cultural change in education. *Globalisation, Societies and Education, 2(3)*, 337-353.
- Richards, C. (2010). From old to new learning: global imperatives, exemplary Asian dilemmas and ICT as a key to cultural change in education. *Globalisation, Societies and Education, 2(3)*, 337-353. doi:10.1080/1476772042000252470
- Richardson, W. (2010). *Blogs, wikis, podcasts, and other powerful web tools for classrooms*. Thousand Oaks, CA: Corwin Press.
- Rienties, B., Brouwer, N., & Lygo-Baker, S. (2013). The effects of online professional development on higher education teachers' beliefs and intentions towards learning facilitation and technology. *Teaching and Teacher Education, 29(0)*, 122-131. doi:10.1016/j.tate.2012.09.002
- Robson, C. (1993). *Real world research: A resource for social sciences and practitioner researcher* (2nd edition). Hoboken, NJ: Blackwell Publishing.
- Roehl, A., Reddy, S.L., & Shannon, G.J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning. *Journal of Family and Consumer Sciences, 105(2)*, 44.
- Rogers, E. (1995). *Diffusion of innovations* (4th edition). New York: Free Press.
- Rogers, E.M. (2003). *Diffusion of innovations* (5th edition). New York: Free Press.
- Rogers, E.M. (2004). A prospective and retrospective look at the diffusion model. *Journal of Health Communication, 9(S1)*, 13-19.
- Rubin, H., & Rubin, I. (1995). *Qualitative interviewing: The art of hearing data*. Thousand Oaks, CA: Sage Publications, Inc.

Ruthven, K., Henessey, S., & Deaney, R. (2005). Incorporating Internet resources into classroom practice: pedagogical perspectives and strategies of secondary-school subject teachers. *Computers & Education*, 44, 1-34.
doi:10.1016/j.compedu.2003.11.001

Ryan-Nicholls, K., & Will, C. (2009). Rigour in qualitative research: mechanisms for control. *Nurse Researcher*, 16(3).

Sadykova, G., & Dautermann, J. (2009). Crossing cultures and borders in international online distance higher education. *Journal of Asynchronous Learning Networks*, 13(2), 89-114.

Sahin, I. (2006a). Detailed Review of Rogers' Diffusion of Innovations Theory and Educational Technology-Related Studies Based on Rogers' Theory. *Online Submission*, 5(2).

Sahin, I. (2006b). *Instructional computer use by COE faculty in Turkey: Application of Diffusion of Innovations Theory*. PhD thesis. Iowa State University, Iowa, USA.

Sahin, I., & Thompson, A. (2006). Using Rogers' theory to interpret instructional computer use by COE faculty. *Journal of Research on Technology in Education*, 39(1), 81-104.

Sahl, M.W.A.K. (2002). Tracing Teachers' Use of Technology in a Laptop Computer School: The Interplay of Teacher Beliefs, Social Dynamics, and Institutional Culture. *American Educational Research Journal*, 39(1), 165-205.

Sakayauchi, M., Maruyama, H., & Watanabe, R. (2009). National policies and practices on ICT in education: Japan. *Cross-national information and communication technology policy and practices in education*, 441-457.

Saldana, J. (2012). *The Coding Manual for Qualitative Researchers*. Thousand Oaks: SAGE.

Saleem, I., Mustafa, S., Bajwa, F., Qureshi, T., & Hijazi, S. (2011). Role of Information and Communicational Technologies in perceived Organizational Performance: An Empirical Evidence from Higher Education Sector of Pakistan. *Business Review*, 6(1), 81-93.

Salehi, H.S. (2012). Challenges for Using ICT in Education: Teachers' Insights. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 2(1).

Samarawickrema, G., & Stacey, E. (2007). Adopting Web Based Learning and Teaching: A case study in higher education. *Distance education*, 28(3), 313-333.

- Sandelowski, M. (2000). Focus on research methods combining qualitative and quantitative sampling, data collection, and analysis techniques. *Research in nursing & health*, 23, 246-255.
- Sang, G., Valcke, M., Braak, J.V., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103-112.
doi:10.1016/j.compedu.2009.07.010
- Sanyal, B.C. (2001). *New functions of higher education and ICT to achieve education for all*. Expert Roundtable on University and Technology-for-Literacy/Basic Education Partnership in Developing Countries. Paris, 10 to 12 Sep, 2001. International Institute for Educational Planning, UNESCO.
- Sarkar, S. (2012). The Role of Information and Communication Technology (ICT) in Higher Education for the 21st Century. *Science*, 1(1).
- Saunders, G., & Klemming, F. (2003). Integrating Technology into a Traditional Learning Environment Reasons for and Risks of Success. *Active Learning in Higher Education*, 4(1), 74-86.
- Schneckenberg, D. (2009). Understanding the real barriers to technology-enhanced innovation in higher education. *Educational research*, 51(4), 411-424.
- Schoonenboom, J. (2014). Using an adapted, task-level technology acceptance model to explain why instructors in higher education intend to use some learning management system tools more than others. *Computers & Education*, 71, 247-256.
- Schwandt, T.A. (1999). On understanding understanding. *Qualitative Inquiry*, 5, 451-464.
- Scrimshaw, P. (2004). *Enabling teachers to make successful use of ICT*. Becta ICT Research. Available from
https://www.researchgate.net/publication/252311191_Enabling_Teachers_to_Make_Successful_Use_of_ICT
- Seechaliao, T. (2014). Lecturers' Behaviors And Beliefs About The Use Of Social Media In Higher Education: A Study At Mahasarakham University In Thailand. *Journal of International Education Research*, 10(2), 155.
- Seidman, I. (1998). *Interview as qualitative research*. New York: Teacher's College Press.

- Seidman, I. (2013). *Interviewing as qualitative research: A guide for researchers in education and the social sciences*. Columbia: Teachers college press.
- Selwyn, N. (2003). *Why students do (and do not) make use of ICT in university*. Paper presented at the 'Finding Common Ground: IT Education, Dearing and Democracy in the Information Society' Conference, University of Leeds Department of Computing, July 9th 2003. University of Leeds Department of Computing - July 9th 2003
- Selwyn, N. (2007). The use of computer technology in university teaching and learning: a critical perspective. *Journal of Computer Assisted Learning*, 23(2), 83-94.
- Selwyn, N., Bulfin, S., & Pangrazio, L. (2015). Massive open online change? Exploring the discursive construction of the 'MOOC' in newspapers. *Higher Education Quarterly*, 69(2), 175-192.
- Shaikh, Z.A. (2009). Usage, acceptance, adoption, and diffusion of information & communication technologies in higher education: a measurement of critical factors. *Journal of Information Technology Impact*, 9(2), 63-80.
- Shaikh, Z.A., & Khoja, S.A. (2011). Role of ICT in shaping the future of Pakistani higher education system. *TOJET*, 10(1), 149-161.
- Shelly, G., Cashman, T., Gunter, R., & Gunter, G. (2006). *Integrating Technology in the Classroom*. Boston: Thomson Course Technology.
- Shelton, C. (2013). "Virtually mandatory": A survey of how discipline and institutional commitment shape university lecturers' perceptions of technology. *British Journal of Educational Technology*, 45(4), 748-759.
- Shenton, A.K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for information*, 22(2), 63-75.
- Shimizu, K., Watanabe, R., Shimizu, Y., Miyake, M., Yamade, K., Horiguti, H., Saito, M., Yoshioka, R., Sakayauti, M., Saruta, Y., Ogura, Y., & Numano, T. (2003). National policies and practices on ICT in education: Japan. In T. Plomp, R.E Anderson, N. Law & A. Quale (Eds.), *Cross-national information and communication technology policy and practices in education* (pp. 335-355). Greenwich CT: Information Age Publishing.

- Shin, N., Sutherland, L.M., Norris, C.A., & Soloway, E. (2012). Effects of game technology on elementary student learning in mathematics. *British Journal of Educational Technology*, 43(4), 540-560.
- Shrestha, G. (2000). *The Utilization of Information and Communications Technology for Education in Africa*: UNESCO, International Institute for Capacity Building in Africa.
- Siemens, G., & Mattheos, K. (2012). Systemic changes in higher education. *In education*, 16(1).
- Siemens, G., & Tittenberger, P. (2009). *Handbook of emerging technologies for learning*. Manitoba, Canada: University of Manitoba.
- Sife, A., Lwoga, E., & Sanga, C. (2007). New technologies for teaching and learning: Challenges for higher learning institutions in developing countries. *International journal of education and development using ICT*, 3(2).
- Silverman, D. (2013). *Doing qualitative research: A practical handbook*. Thousand Oaks, CA: SAGE Publications Limited.
- Sim, J.W.S., & Hew, K.F. (2010). The use of weblogs in higher education settings: A review of empirical research. *Educational Research Review*, 5(2), 151-163.
- Sin, C.H. (2005). Seeking informed consent: Reflections on research practice. *Sociology*, 39(2), 277-294.
- Slaughter, S., & Leslie, L.L. (1997). *Academic capitalism: Politics, policies, and the entrepreneurial university*. Baltimore, Maryland: Johns Hopkins University Press
- Smithson, S., & Cornford, T. (1996). Project Research in Information Systems. Basingstoke: Macmillan Press.
- Soffer, T., Nachmias, R., & Ram, J. (2010). Diffusion of Web Supported Instruction in Higher Education-The Case of Tel-Aviv University. *Journal of Educational Technology & Society*, 13(3)
- Sonia, L. (2012). Critical reflections on the benefits of ICT in education. *Oxford Review of Education*, 38(1), 9-24. doi:10.1080/03054985.2011.577938
- Spector, J.M., Merrill, M.D., Elen, J., & Bishop, M. (2014). *Handbook of research on educational communications and technology*. Berlin: Springer.
- Stahl, B.C. (2008). *Empowerment through ICT: A critical discourse analysis of the Egyptian ICT policy*. International Federation for Information Processing Digital Library; Social

Dimensions Of Information And Communication Technology Policy; 282.
10.1007/978-0-387-84822-8_11.

Stake, R.E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.

Stemler, S. (2001). An overview of content analysis. *Practical assessment, research & evaluation*, 7(17), 137-146.

Strauss, V. (April 25, 2013). *Can computers really grade essay tests?* The washington post.
Available from

https://www.washingtonpost.com/news/answer-sheet/wp/2013/04/25/can-computers-really-grade-essay-tests/?noredirect=on&utm_term=.aed843a48792

Stricker, D., Weibel, D., & Wissmath, B. (2011). Efficient learning using a virtual learning environment in a university class. *Computers & Education*, 56(2), 495-504.

Stuart, I., McCutcheon, D., Handfield, R., McLachlin, R., & Samson, D. (2002). Effective case research in operations management: a process perspective. *Journal of Operations Management*, 20(5), 419-433.

Sturko, P.A., & Gregson, J.A. (2017). Learning and Collaboration in Professional Development for Career and Technical Education Teachers: A Qualitative Multi-Case Study. *Journal of STEM Teacher Education*, Vol. 45(3).

Sugimoto, C., Hank, C., Bowman, T., & Pomerantz, J. (2015). Friend or faculty: Social networking sites, dual relationships, and context collapse in higher education. *First Monday*, 20(3).

Sunal, D.W., Hodges, J., Sunal, C.S., Whitaker, K.W., Freeman, L.M., Edwards, L., Johnston, R.A., & Odell, M. (2001). Teaching science in higher education: Faculty professional development and barriers to change. *School Science and mathematics*, 101(5), 246-257.

Surry, D.W., & Land, S.M. (2000). Strategies for Motivating Higher Education Faculty to Use Technology. *Innovations in Education & Training International*, 37(2), 145-153.
doi:10.1080/13558000050034501

Sutherland, R., Armstrong, V., Barnes, S., Brawn, R., Breeze, N., Gall, M., Mathewman, S., Olivero, F., Taylor, A., Triggs, P., Wishart, J., & John, P. (2004). Transforming teaching and learning: embedding ICT into everyday classroom practices. *Journal of Computer Assisted Learning*, 20(6), 413-425.

- Taber, K.S. (2011). Constructivism as educational theory: contingency in learning, and optimally guided instruction. *Educational Theory*, 39-61.
- Tan, L.C. (2011). Use of ICT for higher education. *ICT for higher education*, 1.
- Taylor, J., & Newton, D. (2013). Beyond blended learning: A case study of institutional change at an Australian regional university. *The Internet and Higher Education*, 18(0), 54-60. doi:10.1016/j.iheduc.2012.10.003
- Tearle, P. (2003). ICT implementation: What makes the difference? *British Journal of Educational Technology*, 34(5), 567-583.
- Thomas, D.J. (1995). *Teachers' stories*. Buckingham: Open University Press.
- Thomas, M., & Thomas, H. (2012). Using new social media and Web 2.0 technologies in business school teaching and learning. *Journal of Management Development*, 31(4), 358-367.
- Thoms, B., & Eryilmaz, E. (2014). How media choice affects learner interactions in distance learning classes. *Computers & Education*, 75(0), 112-126. doi:10.1016/j.compedu.2014.02.002
- Tiene, D. (2004). Bridging the digital divide in the schools of developing countries. *International Journal of Instructional Media*, 31(1), 89.
- Tiernan, P. (2015). An inquiry into the current and future uses of digital video in University teaching. *Education and Information Technologies*, 20(1), 75-90.
- Till, G. (2003). *Harnessing distance learning and ICT for higher education in Sub-Saharan Africa: An examination of experiences useful for the design of widespread and effective tertiary education in Sub-Saharan Africa*. New York: Rockefeller Foundation.
- Tomei, L. A. (2005). *Taxonomy for the technology domain*. Hershey, Pennsylvania: IGI Global.
- Tondeur, J., van Braak, J., & Valcke, M. (2007). Curricula and the use of ICT in education: Two worlds apart? *British Journal of Educational Technology*, 38(6), 962-976. doi:10.1111/j.1467-8535.2006.00680.x
- Tondeur, J., van Keer, H., van Braak, J., & Valcke, M. (2008). ICT integration in the classroom: Challenging the potential of a school policy. *Computers & Education*, 51(1), 212-223. doi:10.1016/j.compedu.2007.05.003

Toro, U., & Joshi, M. (2012). ICT in Higher Education: Review of Literature from the Period 2004-2011. *International Journal of Innovation, Management and Technology*, 3(1), 20.

Townsend, R. (2010). A handbook for teaching and learning in higher education: enhancing academic practice (3rd ed.). *Studies in Continuing Education*, 32(1), 84-86. doi:10.1080/01580370903546797

Tracy, S.J. (2012). *Qualitative research methods: Collecting evidence, crafting analysis, communicating impact*. Hoboken, NJ: John Wiley & Sons.

Trochim, W.M. (2006). *Qualitative validity. Research methods knowledge base*. Available from <https://appliedinduction.wordpress.com/2012/09/07/trochim-research-methods-knowledge-base-read-the-section-on-qualitative-measures-and-all-of-its-subsections-the-qualitative-debatequalitative-validity/>

Tusubira, F.F., Mulira, N.K., Kahiigi, E.K., & Kivunike, N.K. (2007). *Transforming Institutions through ICT: The Makerere University Experience, Kampala*. Uganda: Makerere University.

UNESCO. (2006). *Global Education Digest 2006*. Montreal: UNESCO Publishing.

Vaira, M. (2004). Globalization and higher education organizational change: A framework for analysis. *Higher education*, 48(4), 483-510.

Valcke, M. (2004). *ICT in higher education: An uncomfortable zone for institutes and their policies*. Paper presented at the Beyond the comfort zone: Proceedings of the 21st ASCILITE Conference.

Van Dusen, G.C. (2014). Digital Dilemma: Issues of Access, Cost, and Quality in Media-Enhanced and Distance Education. *ASHE-ERIC Higher Education Report*, 27(5). San Francisco: Jossey-Bass Higher and Adult Education Series.

van Reijswoud, V. (2009). Appropriate ICT as a Tool to Increase Effectiveness in ICT4D: Theoretical considerations and illustrating cases. *The Electronic Journal of Information Systems in Developing Countries*, 38.

Van Teijlingen, E., & Hundley, V. (2002). The importance of pilot studies. *Nursing Standard*, 16(40), 33-36.

- Van Teijlingen, E.R., Rennie, A.M., Hundley, V., & Graham, W. (2001). The importance of conducting and reporting pilot studies: the example of the Scottish Births Survey. *Journal of advanced nursing*, 34(3), 289-295.
- Vandeyar, T. (2006). *A participatory approach to the formulation of an information and communication technology policy : a Q-methodology Case Study*. 2008 International Conference on Computer Science and Software Engineering, Wuhan, Hubei, 2008, pp. 1117-1123. doi: 10.1109/CSSE.2008.1465
- Venkatesh, V., Croteau, A.M., & Rabah, J. (2014). *Perceptions of Effectiveness of Instructional Uses of Technology in Higher Education in an Era of Web 2.0*. Paper presented at the 2014 47th Hawaii International Conference on System Sciences.
- Venkatesh, V., & Morris, M.G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS quarterly*, 115-139.
- Venkatesh, V., Morris, M.G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. *MIS quarterly*, 425-478.
- Verkroost, M.J., Meijerink, L., Lintsen, H., & Veen, W. (2008). Finding a balance in dimensions of blended learning. *International Journal on E-learning*, 7(3), 499-522.
- Vorndam, M., & Ebersole, S. (2002). *Adoption of Computer-Based Instructional Methodologies: A Case Study*. Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications.
- Wake, J.D., Dysthe, O., & Mjelstad, S. (2007). New and Changing Teacher Roles in Higher Education in a Digital Age. *Educational Technology & Society*, 10(1), 40-51.
- Walsham, G. (2006). Doing interpretive research. *European journal of information systems*, 15(3), 320-330.
- Wang, Q., & Woo, H.L. (2007). Systematic planning for ICT integration in topic learning. *Educational Technology & Society*, 10(1), 148-156.
- Ward, L., & Parr, J. M. (2010). Revisiting and reframing use: Implications for the integration of ICT. *Computers & Education*, 54(1), 113-122.
- Weitzman, E. (1999). Analyzing qualitative data with computer software. *Health services research*, 34(5 Pt 2), 1241-1263.

Weller, M. (2011). *The digital scholar: How technology is transforming scholarly practice*: London: A&C Black.

Windschitl, M., & Sahl, K. (2016). Tracing Teachers' Use of Technology in a Laptop Computer School: The Interplay of Teacher Beliefs, Social Dynamics, and Institutional Culture. *American Educational Research Journal*, 39(1), 165-205. doi:10.3102/00028312039001165

Winterhalter, B. (30 September, 2013). *Computer Grading Will Destroy Our Schools*. Salon. Available from
https://www.salon.com/2013/09/30/computer_grading_will_destroy_our_schools/

Wozney, L., Venkatesh, V., & Abrami, P.C. (2006). Implementing computer technologies: Teachers' perceptions and practices. *Journal of Technology and teacher education*, 14(1), 173.

Wright, V.H., & Wilson, E.K. (2007). A partnership of educators to promote technology integration: Designing a master technology teacher program. *Education*, 128(1), 80-87.

Wyld, D.C. (2008). Blogging from the top: a survey of higher education leaders' use of Web 2.0 technologies. In M. Iskander (eds), *Innovative Techniques in Instruction Technology, E-learning, E-assessment, and Education*. Dordrecht: Springer.

Yang, Y. (2009). *Examining university students' and academics' understandings of ICTs in higher education*. Paper presented at the Changing Climates: Education for Sustainable Futures.

Yelland, N. (2006). Changing worlds and new curricula in the knowledge era. *Educational Media International*, 43(2), 121-131.

Yi, M.Y., Jackson, J.D., Park, J.S., & Probst, J.C. (2006). Understanding information technology acceptance by individual professionals: Toward an integrative view. *Information & Management*, 43(3), 350-363.

Yildirim, S. (2007). Current utilization of ICT in Turkish basic education schools: A review of teacher's ICT use and barriers to integration. *International Journal of Instructional Media*, 34(2), 171.

Yin, R.K. (2003). Case study research: Design and methods, 3rd edn. *Applied Social Research Methods*, 5. Thousand Oaks, CA: Sage Publications.

Yin, R.K. (2009). Case study research: Design and methods (Vol. 4th): Thousand Oaks, CA: Sage Publications.

Yuan, L., & Powell, S. (2013). MOOCs and open education: Implications for higher education. A white paper, JISC Cetis Centre for educational technology & interoperability standards. Available from <http://publications.cetis.org.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf>

Yuen, A.H., Law, N., & Wong, K. (2003). ICT implementation and school leadership: Case studies of ICT integration in teaching and learning. *Journal of Educational Administration*, 41(2), 158-170.

Zakaria, Z. (2001). *Factors related to information technology implementation in the Malaysian Ministry of Education Polytechnics*.

Zelick, S.A. (2013). The perception of Web 2.0 technologies on teaching and learning in higher education: A case study. *Creative Education*, 4(07), 53.

Zemsky, R., & Massy, W.F. (2004). *Thwarted innovation. What happened to e-learning and why, A final report for the Weather station Project of the Learning Alliance at the University of Pennsylvania in cooperation with the Thomson Corporation, Pennsylvania*. Pennsylvania: The learning alliance at the University of Pennsylvania.



APPENDIX A

Name of candidate: _____ Age: _____

Gender: Male Female Faculty: _____

Department: _____

A. Biographical/Historical questions	
1.	Can you briefly tell me about yourself: <ul style="list-style-type: none">• Please describe your career path (School, Teaching, University)
2.	How many years have you taught at this University? <ul style="list-style-type: none">• What course(s) have you taught• Which areas of speciality (subject) are you teaching now?• Is this in line with your academic specialisation? Which is?
3.	What position (Rank) do you hold at the University? <ul style="list-style-type: none">• Did you join the University at this rank?
4.	What are your ICT skills? <ul style="list-style-type: none">• What are your current qualifications?• Do you have any qualifications in ICT?• Have you attended any staff-development/training programmes in ICT• Do you have any self-developed skills?

B. Contextual questions: Teaching	
1.	How long have you been using ICT? <ul style="list-style-type: none">• For teaching?• Any Other purpose? (Administration or Personal?)
2.	Why did you decide to use ICT in your teaching? <ul style="list-style-type: none">• Are you compelled to use ICT? By whom or what?• How often do you use ICT in your teaching practice? (Occasionally/All the time)
3.	What motivates you to integrate and use technology in your teaching on campus? <ul style="list-style-type: none">• Personal interest• Opportunity
4.	When planning to use ICT in your teaching <ul style="list-style-type: none">• Are there curricular obligations/requirements?• What are your personal objectives or intentions?• How much of your time do you invest in the planning of your lectures? (per lecture)• Do you have a lesson plan or a particular presentation format?
5.	How do you integrate ICT in your teaching practice? <ul style="list-style-type: none">• Can you reflect on your initial experience in using ICT and how it has affected the way you use it now?• Do you think your pedagogy/teaching strategy changed now that you are using ICT• Can you describe how your pedagogy changed?• Please elaborate on some of your methods that changed in order to integrate technology in your teaching.• Are there any teaching/learning theories or principles that guide your pedagogy?• Has the transition of integrating ICT in your teaching practice been easy? Why?

6.	What opportunities are available to you that allow you to integrate ICT in your teaching practice?
7.	What are some of the challenges and issues you face in using technology in your teaching? <ul style="list-style-type: none"> • Pedagogy challenges • Are they still evident or have they been overcome?
8.	Please describe the specific ICT tools that you are using? And how you are applying them. <ul style="list-style-type: none"> • LMS • Websites • Blogs • Software • Own resources • And explain their relevance in your teaching/learning practice
9.	In order for academics to begin using ICT in their teaching practice: <ul style="list-style-type: none"> • What advice would you give them if they would like to use ICT? • Do you think a change in mind-set is necessary? What about their attitudes or beliefs? • What basic skills do you think are required/necessary?
10	Do you think teaching with technology influences: <ul style="list-style-type: none"> • Your teaching effectiveness? Why do you say so? • Student learning? Why do you say so? • Has the use of ICT changed students' engagement in your lecture delivery?
11	Do you think the use of ICT has influenced your students? <ul style="list-style-type: none"> • Learners' motivation and participation in your lectures (if at all)? • Cater for different learning styles? • Learner morale? In what way and for whom? • Achievement?
12	Are you part of a subject team? <ul style="list-style-type: none"> • What is the nature of the subject team? • Is it only content discussion? Planning? Are there pedagogic discussions or is it a personal choice?

C. Contextual questions: Institutional	
1.	What is the expectation of the university with regard to the use of ICT? <ul style="list-style-type: none"> • Does the University have an e-learning/ICT policy on teaching? • Are you familiar with the policy requirements • How does the University support policy implementation? Resources/Technical Support/Other
2.	How do you collaborate/partner with other academics in making use of ICT? <ul style="list-style-type: none"> • Could you give some suggestions which might contribute in integrating technology in your university?
3.	Could you give some suggestions which might contribute to more academics integrating technology in your university?
4.	What institutional incentives are available to you that motivate you to integrate ICT in your teaching practice? <ul style="list-style-type: none"> • What instructional resources (Time, Money, assistance) are available to you? • Training opportunities
5.	How do you perceive the role of ICT in the professional development of Lectures? <ul style="list-style-type: none"> • Has this happened?

Open question for end of protocol.



APPENDIX B

Field note: Observation Sheet

UNSTRUCTURED OBSERVATION SCHEDULE

Lesson observation schedule File reference				Video file Reference	
Descriptive observation Eliminate preconceptions and note detailed descriptions of everything that is taking place					
Participant	Academic XXX	ICT equipment		Date	Duration
Faculty		For academics		Year of study	
Study Area		ICT equipment			
		For students			
	Topic				
Focused observation (Specific ICT use in Classroom, Pedagogy, ICT skills, teaching aids, learner involvement, time management)					
Observation/Field notes		Special/Pedagogic Or best practice	Time	Soft skills for curriculum delivery	
Selective observation (classroom layout, discipline , Academic Control and classroom management issues)					



APPENDIX B1

Observation notes: (loketo) 28th October 2018.

As I observed the classroom practices of Loketo, I noticed the lecture room was not suitably equipped with ICT tools for the proper conduct of an ICT mediated class. The academic had to wait for over 20minutes for the data projector to be brought from the equipment store and then set it up in the classroom. The data projection was made on the classroom wall that also had various posters from a recently concluded guild election.

The academic took the students through the slide presentation and sometimes offered examples that were not included in the slides. The students hardly asked questions and mainly concentrated on taking notes despite the fact that the academic had earlier on indicated that a copy of the electronic slides was already available on the LMS platform

There was no particular sitting arrangement for the students as they each of them chose to seat where they thought most appropriate. At the commencement of the classroom session, the noise level of the classroom is on its peak. The reason why is because the students are in trying to get settled for their class and some are inquiring from peers. This noise level is managed by the academics by talking to the students. The academic tries to reinforce positive behaviour by talking nicely to the students and by emphasizing the importance of the topics under discussion in that classroom session.



APPENDIX C

MY JOURNAL
<p>Name of study programme: Undergraduate class-Bachelor of hotel and tourism management Date of Visit: July 7, 2016 Year of study: Year 3 Subject Area: Hospitality management Topic: Hospitality and Service Academic: Wakukyalo</p>
<p>Description of Teaching Strategies: The academic started the day's session by recapping key concepts about tourism from the previous session. The facilitator emphasized that Tourism is a 24 hours a day, 7 days a week, 52 weeks a year economic driver and that students who will be working in this industry ought to know that. The academic asked students to recall examples discussed in the previous session about tourist destinations in Europe and the influence of culture on the selection of destinations which attracted more debate and ideas between the students and the academic, before she linked that to the day's main topic. The students were subsequently asked to brain storm (in their different discussion groups) the different ways they would prepare and present different menu items for their multicultural guests. They were asked to make a written summary after their discussion that would be uploaded to one of their online platforms for the benefit of the whole class.</p>
<p>Description of Learning Activities/ Learner's Participation: The students seemed to enjoy the approach that was used by this academic and actively participated in the classroom session. Some of the students were seen taking notes during the discussions. Students were seen to consult each other now and then during their classroom interactions. A few students were seen to be busy with their smart phones when the class was on going.</p>
<p>Description of classroom facilities The only tool that was seen during this classroom session was the facilitator's laptop that was hardly used for the session as she kept writing on the white board the important issues for the students to take note.</p>



APPENDIX D

E-LEARNING PLATFORM

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 - BACHELOR OF REAL ESTATE MANAGEMENT
 - BACHELOR OF SCIENCE IN ACCOUNTING

Course categories:

BACHELORS PROGRAMMES / BACHELOR OF ENTERPREURSHIP AND SMALL BUSINESS MANAGEMENT / BACHELOR OF BUSINESS ADMINISTRATION

BAD31115 Strategic Management

General aims/objectives of the course:

1. To empower the student with knowledge of the basic concepts of strategic management.
2. To give the students an understanding of the nature of strategic planning and the relationship between strategy formulation, strategy implementation and strategy evaluation.
3. To develop the students' abilities in the analysis of business problems and the effective use of the various business disciplines in designing solutions for common strategic business problems.

Lecturer: [REDACTED]

Lecturer: [REDACTED]

BEM 3101 Feasibility Study and Analysis

Lecturer: [REDACTED]

Lecturer: [REDACTED] (Ph.D.)



APPENDIX E



Faculty of Education
Department Science, Mathematics &
Technology Education
12 March 2018

The Participant
Kusoma University
Uganda

Letter of Consent for Participant

Dear participant

I am a PhD student in the Faculty of Education - Department of Science, Mathematics and Technology Education of the University of Pretoria. I am conducting a study to research how academics integrate ICT in their teaching practice.

Your participation in this research will involve being interviewed and observed during the conduct of your normal teaching practice. Although I will try to be as unobtrusive as possible, I may require your valuable input both before and after you conduct your lecture sessions. I will try my utmost to ensure that the initial interview does not exceed 1 (one) hour. You will also be involved in ensuring that the essence of your input captured during the interviews is correctly recorded.

Your participation in this study is totally voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty, obligation and it will certainly not affect your situation position within the university. The results of the research study may be published, but you will remain anonymous.

There are no foreseeable risks or discomforts if you agree to participate in this study. Although there may be no direct benefit to you, the possible benefit of your participation is the research findings and conclusions drawn from the study will be made available to you and you may be invited to research forums/seminars in which this study is relevant.

If you have any questions concerning this research study, please call me (0712) 946 062 or e-mail: baginno2001@yahoo.co.uk

Yours in sincerely,

Baguma Innocent

I, _____ of _____ University give my consent to participate in the above study (The integration of Information Communication Technology (ICT) into the teaching practice of academics at a university in Uganda).

_____ (Signature) _____ (date)

If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Ethics Committee of the University of Pretoria at 012-4205656 or raphaelakanmidu@up.ac.za (Ethics Assistant, Educational Psychology dept., Faculty of Education, University of Pretoria. Aldoel 1-106 Groenkloof Campus)



APPENDIX F



Faculty of Education
Department Science, Mathematics &
Technology Education
12 March 2018

The Principal/Deputy Principal
University
Uganda

Dear Sir/Madam:

RE: REQUEST FOR PERMISSION TO CARRY OUT RESEARCH WITHIN YOUR INSTITUTION

My name is Baguma Innocent, currently enrolled as a PhD student at the University of Pretoria, South Africa

I hereby wish to apply for permission to carry out research within your institution. My research project will involve academic staff. My research topic is "The Integration of Information Communication Technology (ICT) in the teaching practice of academics at a university in Uganda."

The study will involve the observation of academic staff in the lecture rooms during lecture sessions. I will be a passive participant who will do audio recordings, capture still photos and take field notes while the academics and the learners are busy in session. I would like to observe the lecture sessions for a month. During this period, I would also like to go through all relevant documents in order to gain a more in-depth understanding of ICT integration activities in academic practice within the institution.

This research project will also involve semi-structured interviews with the academics after lecture hours. The information obtained will be treated with utmost confidentiality and anonymity and will be used solely for this research purposes only.

Before commencing with any data collection exercise I will first come to the school and explain the research and what each of the participant's role will be. I will explain how I will go about the research and how the audio recordings will be done.

Although there may be no direct benefit to you, the possible benefit of this research findings and conclusions drawn from the study will be made available to your institution and you may be invited to research forums/seminars in which this study is relevant.

If you have any questions concerning this research study, please call me (0712) 946 062 or e-mail: baginno2001@yahoo.co.uk

Your permission in this regard will be highly valued

Yours in sincerely,

Baguma Innocent



APPENDIX G

staff in eLearning training

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staff in eLearning training by eLearning Center - Monday, 4 July 2016, 10:59 PM



has over the years been implementing effort as part of its strategy to increase access to education and reduce costs. The Africa Development Bank extended funds to government of Uganda to support improvement in high education with emphasis on science and technology. All the 8 public universities including the degree awarding institutions have benefitted from this. has received a building for computer science and a smaller one for business incubator. ADB has also funded a variety of other programmes including gender mainstreaming, people with disabilities, activates and eLearning among others.

eLearning Centre conducted a five day training at the Jinja Ci'sand hotel. Each academic department in has an elearning champion and one other person was nominated to attend the eContent development training workshop. The training was intense and staff felt they were ready to go but it requires management to ensure that the facilitating conditions are in place. The training was intended to be in three groups of 12 people however the groups were combined. The training of the three groups were combined together to be able to get the necessary synergy among those who had some knowledge with those who did not. In the past, the Commonwealth of Learning has supported the eLearning programmes. The developing countries have challenges that while the developed world has already adopted the facilitating condition for eLearning are poor in many developing countries including Uganda.

Not many Ugandans have computers and if they do, internet may not be available. For some even if it is available, they cannot afford it. There is also the electricity challenge. While some people may have the computers, the knowledge and the internet he or she may not have electricity or it may not be stable. In Uganda, access to electricity is limited to 20% of the population. With 80% of the population in rural areas even knowing about computers or



APPENDIX H

Kusoma University

ICT Policy-Draft

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APPENDIX I

Axial Coding-Grouping of themes and identification of categories

Category	Sub-Category	Emergent theme
Current pedagogical practices of ICT	Reliance on proprietary software	Maximize content delivery Deliver content more expeditiously Facilitates faster completion of content – can get more done in single period, time Makes delivery of some topics easier and more beneficial for students Demands greater creativity in delivery Difficult to teach abstract concepts/theory topics using ICT Embedding of video, illustrations
	Ambivalence to a learning management system (LMS)	Posting of electronic notes, records Management, Steep learning curve Uploading content
	A shift to web 2.0 technologies for teaching and learning	Social media: Facebook as an interactive learning resource Facebook as a LMS Facebook as a live broadcast tool Blogs as collaborative spaces Blogs as a form of reflective practice, WhatsApp as a communication tool Need to change pedagogy
ICT paradigm shift: changes in teaching practice	Evolving pedagogical role of academics	Makes teacher more engaged Teacher more of guide/facilitator Use more collaborative Better class management & control Helps to create learning environment less intimidating to weaker child



	<p>ICT catering for various learning styles</p> <p>Perceptions of changing student attitudes.</p>	<p>Helps weaker students-draws them into class</p> <p>Caters for different types of learners especially</p> <p>Style still more teacher-centered</p> <p>Style more student-centered</p> <p>Less teacher talk; greater student involvement</p> <p>Learning-small group activity</p> <p>Takes teaching and learning out of classroom to digital environment</p> <p>Able to reach more students</p> <p>Appeals to/reaches more students</p> <p>More attentive , keeps students focused</p> <p>Increased enthusiasm</p> <p>More willing to participate</p> <p>Much more engaged</p> <p>Generates greater student interest, Increased participation/involvement</p> <p>Excites learners, intrigues them</p> <p>Motivation through visual stimulus</p>
ICT as a catalyst for professional development	<p>Academics self-appraisal of their ICT skills</p> <p>Learning through self-study</p> <p>Systemic training and support</p>	<p>Increases teacher enthusiasm and excitement</p> <p>Improves teacher confidence</p> <p>Skill Set</p> <p>ICT Skills for personal use</p> <p>Learning from colleagues</p> <p>Computer basted training (CBT), mentoring, Trial and Error</p> <p>Short course trainings</p> <p>Training workshops</p> <p>compulsion for Professional Development</p>
ICT perceive challenges	Lack of access to ICT for teaching and learning	Access to equipment; availability of ICT ready rooms



	<p>Infrastructure and technical support services</p> <p>Resistance to Change</p> <p>Lack of institutional ICT policy and supporting guidelines</p>	<p>Time constraints Set up time reduces teaching time Loss of class time due to set up or technical problems Slows down lesson Technical glitches</p> <p>Steep learning curve, negative attitudes, inadequate ICT skills, comfortable with old teaching approaches, time to prepare lesson using ICT, additional workload, lack of technical know-how puts academic out of comfort zone. Nature of course content, access to equipment</p> <p>ICT policy, eLearning policy, mandates, administrative support</p>
ICT perceived opportunities	<p>Will to change: beliefs and attitudes of ICT agents of change</p> <p>21st century skills</p> <p>Ubiquity of ICT</p>	<p>Motivation through visual stimulus, perceived benefits, ease of use, convenience</p> <p>Critical thinking, learn more from collaborative experiences using ICT, communication, sharing, interaction, apply knowledge to real world situations</p> <p>Ability to reach students anytime anywhere, personal modems, laptops, smart phones investment in network infrastructure, flexibility,</p>