Exploring associated factors and dynamic relationships between lecturers and their engagement with Technology Enhanced Learning (TEL).

Jennifer Jepson

The thesis is submitted in partial fulfilment of the requirements for the award of the degree of Professional Doctorate in Health Sciences of the University of Portsmouth.

April 2016

ABSTRACT

Background: Much has been written about the way in which technology enhanced learning enables an improved student learning experience by facilitating engagement with greater flexibility and accessibility. For today's health care graduates, technology enhanced learning can also foster a skill-set to meet the changing face of healthcare delivery. Implementing changes in delivery requires lecturers to be cognisant of constructive pedagogy. However, the dynamics of lecturers' engagement with technology enhanced learning, in the United Kingdom, remain largely unexplored.

Aim: The purpose of this research was to conduct a survey to explore relationships and associated factors which impact on lecturers' engagement with technology enhanced learning in the delivery of health related education.

Methodology: An online questionnaire was developed and extensively piloted. Questions were framed within five dimensions: demography and background information; preferred face to face teaching method; perceptions of the online environment; organisational culture; motivation and learning style. Following the pilot study, an amended version was sent out to 74 universities, of which 49 responded, giving a response rate of 66%.

Results: Data were collected over an eight-month timeframe to include 227 lecturers in the final analysis. Data were analysed using descriptive and inferential statistics. The analysis revealed that whilst lecturers have varying levels of engagement, there has been an overall increase of 'early adopters' utilisation of web 2.0 technologies (Rogers, 2003). The survey instrument also revealed significant barriers in transferring between enquiry based learning as the preferred face to face teaching style, use of web 2.0 technologies including wikis, blogs and podcasts, as well as the difficulty experienced and technical ability required, over and above general computer skills already in place.

Conclusions: In summary, questions within the survey instrument, including those which measure computer skills, use, and teaching style preference, reveal predictors which impact on engagement with technology enhanced learning. Given the predictive value of the survey instrument, health service education providers, universities, and professional bodies might consider it useful as a means of determining engagement, benchmarking professional development activities, and evidence of progression towards teaching excellence.

Contents list

Declaration

Whilst registered as a candidate for the above degree, I have not been registered for any other research award. The results and conclusions embodied in this thesis are the work of the named candidate and have not been submitted for any other academic award

(47,153 words)

List of Tables

List of Figures

Abbreviations

ATI	Approaches to Teaching Inventory
BERA	British Education Research Association
CETL	Centre for Excellence in Learning and Teaching
CITE	Centre for Innovation in Technologies and Education
CPD	Continuing Professional Development
CV	Curriculum Vitae
EBL	Enquiry Based Learning
ECAR	EDUCAUSE Centre for Applied Research
F2F	Face to face
FE	Further Education
HE	Higher Education
HEA	Higher Education Academy
HEE	Health Education England
HEFCE	Higher Education Funding Council for England
HEI	Higher Education Institution
HESA	Higher Education Statistics Agency
HTML	Hypertext Mark-up Language
ICT	Information and communications technology
ILIaD	Institute of Learning Innovation and Development
ILS	Individual Learning Style
IT	Information Technology
JISC	Joint Information Systems Committee

LSI	Learning Styles Inventory
MOOC	Massive Open Online Course
NCIHE	National Committee of Inquiry into Higher Education
NHS	National Health Service
PBL	Problem Based Learning
PgCE	Post-graduate Certificate in Education
RLO	Re-usable Learning Object
RSS	Really Simple Syndication
SPSS	Statistical Package for Social Sciences
SSL	Secure Sockets Layer
TAM	Technology Acceptance Model
TEL	Technology Enhanced Learning
UCAS	Universities and Colleges Admissions Services
UCISA	Universities and Colleges Information Systems Association
UK	United Kingdom
USA	United States of America
VLE	Virtual Learning Environment
WebCT	Web Course Tools

Glossary of Terms

Blended learning: Blended learning is a hybrid of classroom and online learning that includes some of the conveniences of online courses without the complete loss of face to face contact.

eLearning: Learning conducted via electronic media, typically on the internet.

Online learning: Online learning takes into account programmes of learning, courses, modules or resources that are delivered totally online.

Technology Enhanced Learning: The enhancement of existing and new learning and teaching through the utilisation of one or more technologies.

Web technologies: The mechanisms by which computer devices communicate over a network; they include web 1.0 and web 2.0 technologies.

Web 1.0: Web 1.0 technologies such as audio and video; generally defined as technologies that are not interactive.

Web 2.0: Web 2.0 technologies such as wikis, blogs, and YouTube™; generally defined as technologies that have an interactive element.

Acknowledgements

To every academic who took the time to respond and then participate: thank you. Without each and every one of you, I would not have come this far,

Dr Ann Dewey and Dr Penny Delf: You have provided guidance and support, and I have learnt from you both. I thank you, without you I would never have got this far,

Dr Stephanie Meakin: Always supportive and encouraging, and the best line-manager anyone could ask for – an immeasurable thank you to you, without your understanding I would never have got this far,

Hamis Mugendawala: Your brain is like a statistical computer package - a most sincere thank you to you. Without your help I would never have got this far,

Dr Alex Furr: Do you sleep with your telephone? Whatever my survey crisis you always seemed to answer my queries immediately, and boy were there a lot. Thank you, without your help I would not have got this far,

Rosie Jepson: Without you, the conceptualisation model would not have been so creatively designed. I thank you for this, you enabled me to go a little farther,

Maureen and Keith Jepson, my wonderful parents: From an early age you have always been there for me and have supported my endeavours. At 17 years of age, a career which started off with cadet nursing, seemed like an OK thing to do. It's a career that has stood the test of time … I have come a long way, I have come far. I thank you both for all that you have done, and continue to do for me, and for the long, encouraging telephone conversations that have been a feature throughout my adult life, and most definitely during this programme of study.

And last, but by no means least, Warwick. Somewhere along life's journey you make a turn and find what you have always been looking for. Without your encouragement, and the influence of your determined attitude to all things in life, I would not have come this far, I thank you with all of my heart.

I take pride in how far I have come, I have faith in how far I can go, and for the most part I have enjoyed the journey (adapted from Michael Josephson, www.whatwillmatter.com).

Dissemination

Jepson, J., Dewey, A., & Delf, P. (2014). *Lecturers' experiences and perceptions of the transition from traditional taught courses to an online (internet) environment utilising technology enhanced learning*. Free paper at the 6th International Conference on Education and New Learning Technologies, Barcelona, Spain, July 2014.

Jepson, J. (2014). *Higher education lecturers' experiences and perceptions of the transition from traditional face to face taught courses to an online (internet) environment utilising technology enhanced learning*. A moderated poster presentation at the Institute for Learning Innovation and Development [ILIaD] Inaugural Conference, University of Southampton, November 2014.

Chapter 1 – INTRODUCTION

The place for technology in higher education continues to rapidly grow, particularly for health related courses, where reduced classroom hours and less protected study time, has led to widespread increase of interest across the United Kingdom (UK) (Petty, 2013). This increase, over time, has led to an abundance of confounding descriptive terminologies and definitions being used to describe Technology Enhanced Learning (TEL) within the literature. Recognising the use of interchangeable terms such as eLearning, online or flexible learning, computer assisted learning, and blended learning, significantly add to the complexity of TEL (Kirkwood, 2009; Bayne, 2015). ELearning however, is probably the most widely used term, but as Mason and Rennie point out, the emphasis here can vary sometimes focusing on content, or communication, or on the technology itself (2006). In their book, which focuses on improving the quality and outcomes of learning, university educationalists Goodyear and Retalis (2010) promote the umbrella term 'technology enhanced learning' because it lends itself to interpretation by educators, in other words it is not restrictive to pedagogical approach or choice of technology. Furthering the complexity however, they also recognise the terms computer-assisted instruction, computer-aided learning, networked/online learning and eLearning as all carrying similar connotations to TEL, with all terms being used interchangeably to encompass any educational situation where technology is being utilised to help people learn. Historically, the Higher Education Funding Council for England [HEFCE) in 2009, replaced their long-time use of the term eLearning (due to its narrow definition), to the more explicit phrase 'enhancing learning and teaching through the use of technology'. Hence, for the context of this study, TEL is defined as the enhancement of existing and new learning and teaching (HEFCE, 2009), through the utilisation of one or more technologies. The notion of TEL continues to encompass the enhancement value of technology in learning and teaching, although as Bayne (2015) argues, educators need to 'widen debates to include cultural, material, political and economic assemblages' when considering how technology acts on education and education acts on technology (p.18).

In 2011, the HEFCE published the Collaborate to Compete Report, which stated that TEL is a viable option to provide education to vast numbers of students. The report highlighted the changing face of higher education domestically and globally, and suggested that the UK must grow its share of expanding markets internationally and contribute to the national economy. The latest data suggests that UK universities' contribution to the UK economy has substantially increased (Kelly, NcNicoll & White, 2014). To continue building on the success of education delivery, there has to be an acknowledgment of the contribution made to the national economy, by fee paying students from overseas, and an awareness that overseas students, and indeed students in the UK, make choices relating to where they want to study.

Online education, delivered from any university in the world, provides students with more options for studying, and therefore to remain competitive, UK universities cannot afford to be complacent. The increase of access by international and European marketing; the globalisation of higher education, offers flexibility of study options for all students (Wilkinson, Forbes, Bloomfield, & Fincham Gee, 2004; Schneckenberg, 2009). UK universities also need to be flexible and dynamic in their delivering of education, particularly as the predicted projection is estimated to be 120 million students worldwide by 2020 (Yuan & Powell, 2013).

The reasons for this changing face are multifaceted, and include increasing accessibility to all (Amirault, 2012; Cragg, Edwards, Yue, Xin, & Hui, 2003). Of significance, is the world-wide adoption of mobile technologies, enabling people who cannot attend university, for whatever reason, the opportunity to overcome potential barriers to accessing education. Higher education institutions are all competitors in a competitive market (Kregor, Breslin, & Fountain, 2012; Owens, 2012; Selwyn, 2007). The relatively recent development of online learning in the form of Massive Online Open Courses (MOOCs) demonstrates, with worldwide appeal, the competitive edge of education (Amirault, 2012; Beaven, Comas-Quinn, Hauck, de los Arcos, & Lewis, 2013).

Many universities are recognising the need to expand their portfolios of educational delivery, but slow responses to the adoption of TEL have been

reported by the HEFCE, where lecturer engagement was noted as being a significant factor, particularly in the slow progression of online learning and teaching (2011).

Higher education provision for healthcare programmes of learning

Higher education institutions (HEIs) must evolve and include the trends that affect how we all learn, solve problems, and in the 21st Century, how we enhance the way we live. The concept of strengthening flexible learning; giving students the choice of pace, place and mode of their learning, is seen as the chance to enable new choices for learners through TEL (Kettle, 2013). Conversely, Kettle (2013) notes that flexibility for academic staff may conflict with that for learner and employer, hence all three areas; pace, place, and mode, need careful consideration in order to foster and enhance TEL. HEIs are continually being driven by a national skills agenda (Leitch, 2006), putting emphasis on higher education providers to address professional development needs flexibly. Providing flexible education, particularly in healthcare arenas can be seen to address two emerging issues, the first as indicated, is in the provision of online education, the second is the embracing of new technologies and the transferability of skills which may have a benefit to patient care. Technologies are seen by the Department of Health [DH] Workforce (2011), as a means to provide enhanced learning for the benefit of patient care. The National Health Service (NHS) confirm the need to use modern education techniques and are broadening their agenda to reflect this. By embracing collaborations with higher education, relationships between the two organisations, some of which will include the upskilling of all staff, are to be strengthened. Indeed, Health Education England's vision is that healthcare in the UK is underpinned by world-class education and training that is enhanced through innovation and emergent technologies and techniques (National Health Service, 2015). The nature of healthcare embraces clinical education, the healthcare graduate needs to possess technical skills and have good communication skills. Fostering communication skills in a digital environment can be achieved through education providers addressing blended learning strategies which are mutually beneficial. In reality, the strategy employed by HEIs needs to actively promote technology enhanced learning through a

variety of technologies which facilitate the learner to achieve their learning outcomes, as well as increase transferable skills in using technologies in the provision of health care.

To prepare for the challenge of 21st Century trends in technology, Robin, McNeil, Cook, Agarwal, and Singhal (2011) developed the following five recommendations as a starting point for the use of technology as it applies to health care related education:

> *"1. Using technology to provide/support experiences for learners that are not otherwise possible – not as a replacement for, but as a supplement to, face-to-face experiences,*
>
> *2. Focusing of fundamental principles of teaching and learning rather than learning specific technologies in isolation,*
>
> *3. Allocating a variety of resources to support the appropriate use of instructional technologies,*
>
> *4. Supporting faculty members as they adopt new technologies, and*
>
> *5. Providing funding and leadership to enhance electronic infrastructure to facilitate sharing of resources and instructional ideas" (p.435).*

Lecturer engagement

At the University of Southampton, where the provision of health sciences education and training ranks highly on the agenda, little had been carried out to promote online education delivery. Anecdotal evidence suggested that although lecturers demonstrated interest in TEL, they lacked the confidence and technical skills to produce effective online materials; thus mirroring the findings from the HEFCE. There is nevertheless a reported gradual increase in the use of technology in health related disciplines; much of the published literature however is focused on the student experience as opposed to lecturer engagement (Carlson & Olson, 2001; Petty, 2013). Despite the proliferation of publications, many highlight the problems associated with TEL environments (Adams & Timmins, 2006; Estabrooks, O'Leary, Ricker, & Humphrey, 2003; Nemanich, Banks, & Vera, 2009). Some of the issues raised relate to lecturers not knowing

how to use the technology well, including the use of under-developed engagement activities. Moule, Ward and Lockyer (2010) and Twomey (2004) concur that the effectiveness of TEL is related to the lecturer's ability to use it.

With the increasing numbers of online learners, the identification of attributes associated with staff involvement, training and educational development, urgently need to be researched (Hodges, 2008). The lecturer's lack of ability to use TEL had been recognised as a factor impeding engagement, with numerous authors suggesting that the preparation of educators in the use of technology, particularly when this is unfamiliar to them, is essential to the success of online learning (Bloom & Hough, 2003; Lowry & Johnson, 1999, Morris, Buck-Rolland & Gagne, 2002; Nemanich et al., 2009). Little empirical evidence exists to date to provide direction for staff support and development.

By highlighting the issues which have been discussed for over a decade within the literature, the area of interest for this study is that of exploring the dynamics of lecturers' engagement with TEL. Dynamics, for the purposes of this study, is defined as the patterns of growth, change and development (Merriam-Webster, 2015), which influence lecturers' engagement with TEL. As a result of exploring the dynamics relating to lecturers' engagement with TEL, future guidance for staff support and encouragement may emerge which could provide employers with a structured approach to staff development programmes. In order to pursue this area of interest, a systematic literature review was firstly undertaken to explore what is already known about lecturers' engagement with TEL, this can be found in the next chapter.

This thesis, which forms part of the Professional Doctorate in Health Sciences programme, set out to explore the associated factors and dynamic relationships between lecturers' engagement with TEL in Higher Education establishments in the United Kingdom, and is divided into seven chapters.

Chapter One has presented an introduction to the thesis through the provision of background information, the area of interest posed, and a critique of the terminology associated with TEL.

Chapter Two provides the background for the study through a comprehensive review of related literature presented in three sections. The first section explores higher education delivery, the trends of rapidly changing technologies, and their impact on the pedagogical design of education delivery. The second section examines the literature relating to faculty support, lecturers' self-belief and self-efficacy, organisational culture and higher education policy drivers. The third section briefly considers learners and technology enhanced learning, particularly in respect of transferable evidence which influences their engagement.

Chapter Three considers the impact of the changing face of TEL on the lecturer by reviewing research which focuses on the dynamics involved with the delivery of technology enhanced learning. Three emerging themes are discussed: digital culture; digital participation, and; digital challenges. The research questions guiding this study are presented here. Findings from the literature, directed by the research questions, provide a basis for the development of the theoretical framework. The chapter concludes with a visual representation of a conceptual model which demonstrates the presumed relationship between the variables.

Chapter Four details the philosophical considerations and research methodology of the study. The development and piloting of the survey instrument, which set out to ascertain the validity and reliability of the survey instrument prior to its use in the main study, is explained in detail here.

Chapter Five presents the main survey. Quantitative data analysis, using descriptive and inferential statistical methods, is examined, with the findings and results being provided to illustrate the lecturers' engagement with technology enhanced learning.

Chapter Six discusses the findings in relation to the current evidence base as it relates to technology enhanced learning and related fields. The limitations of this research study are presented here along with recommendations for further educational research.

Chapter Seven presents a reflective account, utilising a recognised reflective framework, of the personal learning journey undertaken for the Professional Doctorate in Health Sciences training.

The final sections respectively present the references for all source materials which have been used to inform this study, and the appendix of research related supplementary materials which offer the addition of useful information and insights into the research undertaken.

Chapter 2 – RESEARCH FINDINGS OF THE LITERATURE

This chapter will contextualise the dynamics of technology enhanced learning and identify what is already known about lecturers' engagement within the health science sector of higher education establishments. The chapter concludes with the development of the research questions.

2.1: The Dynamics of Technology Enhanced Learning

In considering the dynamics of TEL: lecturers' development, growth and the concept of change, a systematic review of the literature was conducted to comprehensively explore the current evidence base utilising web based searching techniques and tools.

2.1.1: Review method

The starting point for the systematic electronic literature search emerged from initial key words set out as part of my original research study proposal assessed at Stage 1 of the taught part of the professional doctoral programme. The first systematic literature search took place during February 2011, but was updated and applied in September 2014. The purpose was to see what research, and research approaches, had previously been conducted and to learn more about what is known already in relation to lecturers' engagement with TEL

2.1.2: Search strategy and results

Principle searches for this comprehensive literature review were made through education databases using EBSCO hosting, these included: Informaworld; Ingentaconnect; Science Direct and Wiley Interscience. The Nursing database, Cumulative Index to Nursing and Allied Health Literature *(*CINAHL), was also explored through EBSCO hosting. The ERIC database was included in this search because it included a wide geographical coverage which complimented the EBSCO databases.

In the EBSCO host and ERIC database, search modes added Boolean operators to combine terms used, and, by including SmartText searching and Phrase recognition, further key words were identified and included. Identifying synonyms,

spelling variants/truncation ensured maximum sensitivity (or recall). Incorporating a high level of sensitivity into the search strategy identified all relevant topics, as well as a high level of irrelevant articles. Retrieving all potential studies, regardless of design, nevertheless provided the best opportunity for identifying all available literature and research.

Although not explicit within the research study title, key words related to the discipline of nursing, seen initially as the primary focus for professional lecturers who were to be approached in the research study, were also included in the search strategy.

Searches used the following subject headings, key and free terms, and truncation in various combinations: technology/ enhanced/ education; online/ electronic education/ learning; academic staff/ teachers/ educationalist/ lecturers; staff experience, staff perception, staff support, staff competence, staff training/ development/skills; teaching the teachers/using technology to teach teachers; and nurse education.

The following criteria were used to select the articles:

1. All types of study designs published in scientific journals initially between 2007 and February 2011, a four-year time frame was chosen to enable comment on recent practice.

2. Studies that reported the impact of web technologies in higher education,

3. Studies that focused predominately on lecturers/academics rather than student/learner engagement with TEL,

4. Studies that focused on the lecturers' perceptions of the teaching environment,

5. Studies that addressed barriers and enablers to behaviour change through the use of web technologies/eLearning,

6. Studies that explored other associated factors i.e., computer skills, staff support,

7. Studies that were published in languages other than English were excluded due to lack of opportunity to seek translation, and translation costs,

8. Conference proceedings, book chapters, reviews, and protocols were included initially, however once retrieved, were isolated for background reading.

Search strategies, seen in Appendix A, included an update from 2011 (to avoid duplication) up to 2014. Additionally the internet search engine Google Scholar; was configured to send Scholar alerts to a mobile device when new articles, which included the key words of online education, technology enhanced learning, technology enhanced learning in healthcare, and web based learning, had been published. The JISC Zetoc alert service was similarly configured to send mobile notification of published articles, containing the search string of technology enhanced learning, and online learning.

The initial search resulted in 304 citations. Source of publication and academic credibility were scrutinised, particularly as the complexity underpinning the dynamics of lecturers' engagement with TEL revealed a myriad of publications, many of which were deemed unsuitable for this research study. Duplicates were removed, leaving a total of 175 citations for review. Assessment of the abstracts and subsequent review of content revealed continued reference to original research which highlighted fundamental concepts and precedence relating to the dynamics of technology usage, this culminated in a further 14 citations for review.

The second search resulted in 2,316 hits, which after removal of duplicates, and unsuitable publications, revealed the identification of 202 new citations. Source of publication and assessment of the abstracts were further scrutinised which resulted in 83 citations for review. The proliferation of academic papers published during 2011 – 2014 indicates growing interest in the area of technology and its application to higher education. More detailed inspection revealed discussion papers, informatory papers, articles which reviewed local practices, or reflected on educational potential of technologies, as well as those which proposed theories or concepts with no underpinning research, which when removed, left 38 empirical papers for close scrutiny. First described by Savage and Callery (2000) cited in Glasper, Carpenter, Cowen, and Jepson (2013, p.6), a grid was utilised to highlight study design, associations and relationships, as well as the strength of evidence across all 38 citations. The majority of papers, as seen in Appendix B, were predominately quantitative, utilising survey methodology to measure specified indicators. Limitations highlighted small sample sizes, unconfirmed

validity and reliability, limited exposure to UK higher education sites, or limitations to the population under scrutiny. All full text articles, resulting from the searches were stored as portable document files (pdf) using cloud technology.

To summarise the findings, the literature review is presented within three key sections: Higher Education learning and teaching, including educational learning theory and its philosophical underpinning; lecturers and technology enhanced learning, and the final theme; learners and technology enhanced learning, which considers literature highlighted in the review that may be of significance to lecturers when developing online learning resources.

2.2: Higher Education Learning and Teaching

This first section explored higher education delivery in its broadest sense, as well as the trend of rapidly changing technologies and their impact on the pedagogical design of education delivery.

2.2.1: Education delivery

Traditionally, educators would say that lecturers present content which learners receive (Owens, 2012). The receipt of educational content, according to Sellar (2009) however, offers no guarantee of learning having taken place. In general, adult learning, based on the principles of andragogy, encapsulates the premise that the learner is self-directed, taking responsibility for their own learning whilst performing self-evaluation on a regular basis (Muirhead, 2007). Adult learners within the university system, mirror these principles in that these learners have, in the majority of cases, personally opted to access education at this level. Conversely, this well-recognised approach to adult learning does not fit readily with online learning environments (Reeves & Reeves, 2008). Lecturers have to creatively facilitate students to make connections between the educational content being delivered. Engaging students by utilising the theory of pedagogy; the approach generally associated with how children learn, summarises this notion (McLinden, 2013). The lecturer's approach to traditional face to face delivery, developed using pedagogical principles, may well pose transitional issues to the way the content is delivered and what the students learn as a result of the process (Richardson, 2005; Postareff, Katajavuori, Lindblom-Ylänne, &

Trigwell, 2008). Knowles (1980) offered a succinct delineation stating that andragogy is the art and science of helping adults learn in contrast to pedagogy which is the art and science of teaching children. Both theories when critiqued can arguably be used interchangeably depending on three factors; one, the subject matter being delivered, two, the receiver's previous knowledge of the subject matter and three, the preferred delivery style of the lecturer (Muirhead, 2007). Compounding this critique is the added complexity of the online medium (Owens, 2012). Recognising the values lecturers hold, including their preferred face to face teaching method (Johnson, 2008; Moule et al., 2010; Salinas, 2008), is equally as important. How lecturers learn, and how lecturers construct meaning from new learning, is based on constructivist theories of learning, in that knowledge gained is influenced by experiences, values and culture (Richardson, 2005).

2.2.2: Web 2.0 technology

Inception of the World Wide Web in the 1990s opened up channels for instant information and communication on a global level. Web 1.0 technology, summarised as one way information giving, was the earliest concept, which rapidly engaged academic communities in their thirst for data, news and documentation (Berners-Lee, 1991). The opening message on the World Wide Web, posted by Berners-Lee, included two now legendary words 'Collaborators Welcome'. Who could have predicted the adoption, engagement and speed of Web 1.0 technologies that rapidly ensued? Web 2.0 technology, often coined the "read/write web" (Richardson, 2006), emerged fully by 2002 with the advent of weblogs (blogs) and really simple syndication (RSS) feeds, both of which marked the beginning of information sharing and exchanging content. The combination of user-created or edited content, combined with easy means of sharing content through high speed connections, led to many sites with a typical "web 2.0" feel, for example YouTube™ and Facebook™. Notwithstanding the commercial and social media development, the scope for education delivery became evident, with the emphasis on content creation rather than content consumption (Kamel, Boulos & Wheeler, 2007).

2.2.3: Web 2.0 technologies and pedagogy: constructing meaning

Online environments provide so much more than a medium for course information. With the advent of web 2.0 technologies, users can now connect different pieces of information for synthesis which can then be redistributed. The potential within higher education has not been overlooked (Ajjan & Hartshorne, 2008; Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012). The use of web 2.0 technologies, for example, wikis (Jepson & Morgan, 2007), weblogs (blogs) (Alexander, 2006), and social interactions (Maloney, 2007) continue to emerge and shape the teaching and learning environment within higher education. The key to success is supported interaction (Kamel, et al., 2007; Bury, Martin, & Roberts, 2006) through the integration of sound pedagogical principles (Pridmore & Bradley, 2010).

Pedagogy is however a notoriously elusive concept to define, particularly within higher education (Sellar, 2009). Kinchin, Lygo-Baker and Hay (2008) offer an interesting analysis which described pedagogy within higher education as the lecturers' ability to scaffold learning which subsequently encourages a cycle of learning through underpinning 'skeletal maps'. This statement builds on the earlier work of Lusted (1986) who defined pedagogy as a concept that 'draws attention to the process through which knowledge is produced' (p. 2).

The term, constructivist pedagogy, brings together the underpinning philosophy of constructivism with pedagogical learning theory (Richardson, 2003), both of which are seen as important in the design of online educational materials (Farkas, 2012). Constructivist learning theory supports the notion that learning is a social process (Kinniburgh, 2010), this means in essence that learning occurs through interactions and sharing information. Whilst the classic works of Piaget (1976), Bruner (1996) and Vygotsky (1978) are rarely acknowledged, more recent literature builds on their principles by stating that learning takes place when the learner builds on their own meaning and understanding of the topic (Biggs, 2012; Schunk, 2000). The lecturer becomes the facilitator of learning (Twomey, 2004), employing pedagogical approaches which recognise the key principles of constructivism; these two key principles are enquiry based learning (EBL) and problem based learning (PBL) (Kinniburgh, 2010; Spronken-Smith, Bullard, Ray,

Roberts, & Keiffer, 2008). Collaborative active participatory learning, such as EBL and PBL, helps students to retain information which individually they may not achieve (Biggs, 2012; Gokhale, 1995). Interestingly, Prensky (2001) identified this point, stressing the importance of using web 2.0 technologies for collaborative learning, particularly as the students of today are considered to be the “digital natives” in the world of the internet and computers.

From the literature, it is clear that web 2.0 technologies and pedagogy are equally as important, their differences nevertheless do need to be recognised; both therefore need to be taken into account when lecturers prepare materials for online education. Conole and Fill (2005) articulated that staff development should not be limited to understanding how new technology tools work, lecturers’ pedagogical beliefs also need to be explored, as without addressing both areas, teaching practices will not change.

The term ‘pedagogy 2.0’ accurately reflects the synthesis of web 2.0 technology, social constructivist and connectivist pedagogies (Farkas, 2012). Connectivist theory, presents a model of learning which provides insight into the skills and tasks needed by learners to progress in a digital era (Siemens, 2004), put simply, learning resides in the connections that exist between people and technology Described by McLoughlin and Lee (2007), pedagogy 2.0 summarises the much more dynamic, creative and generative flexibility of using web 2.0 technologies to make teaching and learning more reflective and self-directed. In addition to social learning, many theorists cite active participation as a major component of effective learning environments (Vighnarajah, Luan, & Bakar, 2008; Schmieder, 2008). The next section will consider the learning environment in greater detail.

2.3: Lecturers and Technology Enhanced Learning

This second section examines the literature pertaining to lecturers within Higher Education establishments, in particular the support available within the workplace in relation to TEL, and whether faculty encourages a sense of self-belief in the lecturers’ ability to engage with online learning. Faculty is defined as the school or department, within a university, where, in the context of this study, health science education is offered (Merriam-Webster, 2015). Organisational culture

and UK policy drivers are explored to identify the impact they too may have on the lecturers' engagement with TEL.

2.3.1: Faculty support

From the literature reviewed, the concept of who 'teaches the teachers' is still largely unexplored. Whilst there is a general increase in the demand for, and uses of information technology and technology enhanced learning, this in itself is seen as creating challenges for lecturers. Challenges highlighted by Blake (2009) and Kopcha (2012) include the support of lecturers in the integration of technology into teaching materials and the provision of adequate user support. Furthermore, to achieve success, lecturers report that the most significant barrier to their engagement with TEL is the lack of time (Browne & Jenkins, 2008; Reed, 2014). Although noted by numerous authors over a wide time scale (Cochrane, Black, Lee, Narayan, & Verswijvelen, 2012, Halstead & Coudret, 2000; Nemanich et al., 2009; Pajo & Wallace, 2001), little is published to identify what the specific needs of lecturers are, or how they can be supported. More importantly, how lecturers are 'educated' in using the 'tools' in order to adapt their traditional teaching materials, i.e. from what is already in existence, into a medium suitable for delivery via TEL, is not offered (Bond & Goodchild, 2013). Johnson (2008) and Salinas (2008) concluded that lecturers do not receive preparation when presenting taught materials into an online environment, their experiences as classroom lecturers are the only source upon which they can rely. Twomey (2004), in a limited literature review of undetermined papers and Parpala, Lindblom-Ylanne, Komulained, Litmanen and Hirsto (2010), in their quantitative study exploring students' approaches to learning, and their experiences of the teaching and learning environment, concur, advocating that the complexities associated with the adaptation of classroom teaching skills to online teaching is an area in need of further research. Parpala et al's study (2010), despite reporting findings from 2,509 students across 11 universities, is limited by the discipline under investigation, and, as advocated by the researchers would benefit from further research, in order to determine understanding of the complex relationships employed in learning and teaching.

2.3.2: Lecturer self-efficacy

Self-efficacy describes a person's belief in their own abilities to succeed (Joo, Bong, & Choi, 2000; Joo, Lim, & Kim, 2013). According to Bandura (1977), self-efficacy can play a major role in how one approaches goals, tasks, and challenges; if self-efficacy is low within individuals, then motivation lacks and the task is avoided. Much of the initial eLearning was championed and driven by 'early adopters'; arguably those that demonstrate motivation and positive engagement (Mayes, Morrison, Mellar, Bullen, & Oliver, 2009; Schneckenberg, 2009; Walker et al., 2014). Conversely, within the literature there is evidence to suggest a lack of lecturer engagement, which could imply a lack of motivation, thereby mirroring Bandura's seminal work on self-efficacy (Govender & Govender, 2009; Hemmings, Kay, Sharp, & Taylor, 2012).

Webster and Hackley (1977) reported similar findings, suggesting that if lecturers demonstrated positive attitudes towards using technology in their teaching, students would be more likely to engage. Hall and Hall (2010) explain this in greater detail by emphasising the gap between learners' expectations and the materials being made available to them through TEL. They state that there may well be elements of technophobia resulting in disengagement on the part of the lecturer. Chinyio and Morton (2006) previously considered this, stating that lecturers may well be timid or un-enthusiastic when it comes to utilising new technologies into their teaching. Pajo and Wallace (2001), and more recently, Hall and Hall (2010), stressed that personal and attitudinal barriers to online technology were more important than organisational barriers. Whilst the evidence suggests that self-efficacy prevails, Gupta, White and Walmsley (2004) suggest that lecturers who are reluctant to adopt, may feel pressurised by their institutions to do so, which may lead to their reluctance to fully engage with the process. Selwyn (2010) and Simosi (2012) agree, concurring that the lack of engagement could be compounded by cultural barriers within institutions.

2.3.3: Organisational culture

Within Higher Education, organisational culture is complex and difficult to define. The two concepts, organisation and culture are individually complicated and even more so when viewed in conjunction with eLearning (Egan, Yang, & Bartlett, 2004). What is clear however, is that motivation in relation to the transfer of

learning, is a factor attributed to the culture of the organisation. In this context the culture of the organisation can be strongly linked to the support lecturers receive (Czerniewicz & Cheryl, 2009), reward for innovation, eLearning strategies, or policies for learning and teaching using technology (Hollis & Madill, 2006; White, 2007; Churchill, 2011; Walker, Voce, & Ahmed, 2012; Walker et al., 2014). Organisational culture, according to Tsai (2011), who undertook quantitative research which surveyed 243 nurses employed in two hospitals, and Canrinus, Helms-Lorenz, Beijaard, Buitink, & Hoffman (2012), reflects the values, beliefs and behavioural norms that are used by employees in an organisation to give meaning to the situations that they encounter, it can clearly influence the attitudes and behaviour of the staff. Canrinus et al. (2012) further report, in their online survey of 1,214 teachers working in secondary education, a strong sense of job satisfaction, self-efficacy, commitment and motivation, however, due to the exploratory approach taken, the findings remain tentative.

Without organisational support, guidance and direction, the adoption of technology enhanced learning, in an online environment, can be difficult (Walker et al., 2012). Indeed, as the HEFCE (2011, p.25) report states:

> *"Even where staff are keen to engage with online learning, the level of support for them may be inadequate."*

2.3.4: Policy drivers

During the 1990s, mirroring the rapid increase in technology and eLearning developments, policy makers were quick to provide direction to universities. Pilot projects were established in 1995 by the UK wide Joint Information Systems Committee (JISC), to identify and disseminate good practice in developing an information strategy. Whilst named an information strategy, many of its elements related to technology and included all types of data such as emails and records management. The Dearing Report (National Committee of Inquiry into Higher Education [NCIHE]) concluded that few institutions had begun to exploit available technology, stating that staff resistance was the main reason why there had been a slow uptake (Dearing, 1997). Indeed, as reported in the Universities and Colleges Information Systems (UCISA) survey of technology enhanced learning for higher education, returned from 74 out of 213 UK universities, staff skills relating to the use of podcasting, use of e-portfolios, e-assessment, blogs and

wikis, were overwhelmingly noted as the greatest challenge to academics, with staff development being seen as the primary remedy (Browne, Hewitt, Jenkins, & Walker, 2008). As these new technologies continued to emerge, the Melville Report suggested that their use in higher education continued to be patchy (Melville, 2009). There was a clear directive within this report, which was aimed at increasing staff engagement with online learning; the wherewithal of the lecturer however, was nevertheless overlooked in favour of promoting student perception and engagement. Within all of these reports the message was clear; educators must be about the business of designing learning environments that capitalise on effective technologies to enhance learning outcomes for their students. The Collaborate to Compete Report (HEFCE, 2011) reaffirms that changes in technology are rapid, whereas the development and adoption of the appropriate pedagogy are not. Current and future generations of students expect high-quality, flexible learning experiences; the challenge for academics is to meet their expectations. The role of the HEFCE and the JISC in encouraging development of these strategies continues to be widely acknowledged today (Walker et al., 2012; Walker et al., 2014). Of interest are the five top challenges facing HEIs in relation to the support that will be required for lecturers and students, in order to facilitate effective TEL (Walker et al., 2012, p.63):

1. Lack of support staff/specialist skills/resources
2. Mobile technologies
3. Staff development
4. E-assessment, including e-submission, e-marking and e-feedback.
5. Lecture capture/recording

2.4: Learners and Technology Enhanced Learning

This third section examines emergent literature which highlights the importance of acknowledging student concerns when developing online learning resources. The first area considers learner engagement with TEL, the second area considers students' learning styles, whilst the third area considers the quality of the learning environment as it relates to the learners' online experience.

2.4.1: Learner engagement with TEL

Learner engagement with TEL continues to be researched, and whilst the findings highlight recommendations for lecturers to implement, the underpinning concept of 'learning' appears to be overlooked. Conflicting findings in the literature do little to assert a clear picture of student/learning engagement. McGill and Hobbs (2007), in their quantitative online survey of 267 students, and Jump (2011), in a systematic review of 16 articles, which explores why university lecturers enhance their teaching through the use of technology, suggest that the use of a Virtual Learning Environment (VLE), for anything other than information giving, is a consistent finding reported by learners. McGugan and Peacock (2005), in their action research study, which employed an online survey and observation of 30 learners from one university, found that learners were comfortable and confident with using the internet for email, but less so for engagement, for example, with group communication such as chat rooms or discussion forums. Curran (2001) suggested that in the early development of online programmes, the teaching processes were driven by the technology rather than by learner need, with no acknowledgment being made to learning theory. Whereas Peters (2000) stated that autonomous learning was clearly underpinned by pedagogical principles and appropriate technologies which have changed the way lecturers teach. What is clear, is that the encouragement of engagement with learners through dialogue, appears to be paramount to the success of online learning (Chinyio & Morton, 2006). Hodges (2008) and Paechter, Maier, and Macher (2010) agree, stating that that the lecturer's support and expertise are crucial to the learner's acquisition of knowledge and skills in an online environment. Constructing meaning through active participation, is a major component of online learning and teaching, of which the lecturer needs to be cognisant in order to create an effective learning environment for learners (Pridmore & Bradley, 2010).

2.4.2: Learning Style

Although sparse, literature confirms that psychological readiness and the students' learning style may affect their willing to engage with online education, indeed Frith and Kee (2003) recommended an interesting point in that they suggested that these factors needed consideration for future selection of participants to online learning and teaching courses. Psychological readiness can

be simply defined as knowing what to expect and being prepared for it (Kreber, 1998). Dray, Lowenthal, and Miszkiewicz's (2011) more recent focus on learners' readiness for online learning, identified learner characteristics and technological capabilities as being the two most prominent areas for exploration. Within learner characteristics, Dray et al's. (2011) quantitative research explored, through an online survey, the individual learning style of 501 students studying at one university, which, although reporting validity of the instrument used for measuring learner characteristics and engagement with technology, was limited by findings which implied students were reporting on their personal life experiences of engaging with technology, rather than use in an educational context. Chiou (2008) had previously explored this area, in a college wide survey of 244 students, reporting a positive correlation between experience-driven learning styles; those that favour collaborative learning, and the delivery of more technologically based courses. However, despite identifying a positive relationship, the generalisability of the findings are limited by the type of course undertaken by the students, and the level of education. Saeed, Yang, and Sinnappan (2009) built on this research by reporting findings from 204 university students, undertaking a web programming course, who took part in a quantitative online survey to determine learning style and technology preferences for emerging web technologies. Whilst a clear link was established between learning style of the student, utilising the Felder and Soloman (1993) learning styles inventory, and their engagement with technology, the findings are limited by the technologies employed in 2007, and the population under scrutiny. How the lecturer learns however, and if it is specifically determined by their individual learning style, is an area not previously researched, and yet, if identifiable, could help policy makers to target professional development activities which enhance future development with TEL provision. Professional development, seen as a critical component of improving the quality of education, is utilised to help lecturers remain current with changes in education delivery (Jones & Dexter, 2014; Lawless & Pellegrino, 2007)

2.4.3: Quality

There are many articles which have reviewed the advantages and disadvantages of online learning from the learner's perspective (Halstead & Coudret, 2000; Jones & Harmon, 2002; Premkumar et al., 2010), very few however evaluated the quality of the educational material (Chen, Chang, Hung, & Lin, 2008). Quality

in the context of learners and technology enhanced learning, according to Collis and Moonen (2008), relates to the understanding and clarity of both the course information and the assessment strategy employed. Reporting findings from a quantitative study, surveying 203 university students' assessment of the quality of the elearning experience, Udo, Bagchi, and Kirs (2011), whilst agreeing that eLearning quality does relate to the online learning environment content, cannot generalise their findings due to the student population being limited to only one university. Underpinning these conclusions however, are the teaching design and approach, and the learner's willingness to engage. Rovai, Ponton, Derrick, and Davis (2006) report, from a four year comparative analysis case study which evaluated virtual and traditional classrooms, that learners need to know the differences between the design of online and taught courses and how the pedagogy differs. Despite highlighting the difference between teaching effectiveness in online and face to face teaching, the findings were limited due to the population surveyed. The concept, nevertheless, is not dissimilar to that which could apply to lecturers, as they too need to recognise the differences in relation to face to face taught delivery, and learning and teaching delivered through an online medium (Farkas, 2012; Kinniburgh, 2010).

2.5: Summary

Lecturers develop many skills in order to fulfil their role; one that is increasing is the online mode of delivery through the introduction of technology enhanced learning. What is evident from the literature reviewed is that there is a clear difference between developing TEL and implementing TEL, both of which need to be addressed (An & Williams, 2010). The development of TEL illustrates the benefits of employing pedagogical principles when utilising web 2.0 technologies (Farkas, 2012; Kinchin et al., 2008). The pedagogical principles leading the development of TEL, rather than the technology being the driving force. The implementation of TEL conversely, suggests that not all web 2.0 technologies are known to lecturers, their uses are not fully understood, and the support available in relation to protected time for staff development, are at best sporadic (Higher Education Funding Council for England [HEFCE], 2011). Time for staff development in relation to acquiring new skills in using technologies, or in

designing online resources, according to Laurillard et al. (2013), often becomes a competing task with other more immediate development activities, for example, administrative skills, where upskilling is imperative to the adherence of university regulations and procedures. The upskilling of research skills development, whilst also secondary to university requirements, ultimately results in less time for learning about teaching. Nevertheless, in a competitive market the perceived advantage of providing online courses is viewed positively, particularly for post-graduate health related programmes of study. Practitioners in health related professions are faced with a rapidly changing work environment, have less study leave time, and in an increasing technological age, have increasing access to web materials.

2.6: Development of the Research Questions

In light of the findings identified in the literature, the following research questions have been developed to explore the dynamics of lecturers' engagement with technology enhanced learning.

1. *"How does the level of engagement with TEL relate to the length of employment held by the lecturer, the beliefs held in relation to working with computers, and, the use of web technologies?"*

The notion of digital natives (Prensky, 2001; Robin et al., 2011; Thorpe & Edmunds, 2011) implies that the vast majority of students within Higher Education are digitally literate; digital literacy refers to the acquisition of skills, knowledge and understanding of digital tools, enabling them to create, collaborate and communicate using digital technologies (Hague & Payton, 2010). Can this be said of academics, particularly as to be in this role implies an age range that does not fit with the concept of being a digital native?

2. *"How does the lecturer perceive their computer use, their beliefs about VLE usage, and what impact does this have on their engagement with TEL?"*

The introduction of computers in the early 1980s, complemented by the inception of the World Wide Web in the 1990s, led to the evolution of VLEs (Jump, 2011; McGill & Hobbs, 2007) and online learning and teaching (Blin & Munro, 2008) in Higher Education Institutions (HEIs). However, whilst computers are now common place, some universities have seen little significant impact of their use on teaching practices; the adoption of TEL, for some, has been challenging (Gilbert, 2011; HEFCE, 2011; Sun, Tsai, Finger, Chen, & Yeh, 2008). Exploring the lecturer's growth and development in using computers and VLEs may well offer insight into their engagement with TEL.

3. *"What relationships exist between preference of face to face teaching method, engagement with TEL, web technologies a lecturer uses to support online teaching, and attitude towards using a VLE?"*

There is evidence to suggest that the transition of taught materials into an online environment is complex and in need of further research (Parpala et al., 2010). This complexity may well arise not only from the development of TEL, but equally as important, by its implementation (An & Williams, 2010). Exploring the diversity of approaches utilised in face to face teaching and how they translate to an online medium, may offer insight into the complexities lecturers face. Furthermore, by identifying which technologies are utilised, and lecturer's receptivity when exposed to new technologies, barriers and enablers could be identified which provide insight into future training needs and support for inclusion in local policy and staff development.

4. *"What relationships exist between the culture of the HEI, as measured by the perceived level of support the lecturer experiences and their level of engagement with TEL?"*

Organisational culture according to Churchill (2011), Walker et al. (2012) and Walker et al. (2014) can be strongly linked to lecturer support, this may well be an influencing factor for the lecturer in relation to their level of engagement with TEL, and as such is to be explored in this study.

5. *“What factors does the lecturer envisage will impact on any future engagement with TEL?”*

Evidence reviewed within the literature search highlights the complexities associated with lecturers’ engagement with TEL, but what about the future? Reference to lack of time (Browne & Jenkins, 2008; Reed, 2014), lack of confidence (Hall & Hall, 2010; Pajo & Wallace, 2001), and lack of organisational support (Czerniewicz & Cheryl, 2009), need to be explored further in order to measure any growth, development or change within these areas.

6. *“What values does the lecturer perceive to be of importance in relation to their employment, does this have a relationship on their motivation to engage with TEL?”*

Personal work values and motivation are positively correlated to employee job satisfaction (Tsai, 2011; Canrinus et al., 2012), and whilst not previously researched in the context of engagement with TEL, this study seeks to determine if personal work values and job satisfaction positively influence the lecturer’s engagement with TEL. The level of engagement with TEL may also be significantly affected by an individual’s personal work values and motivation within their role.

7. *“How does the learning style of the lecturer influence engagement with TEL?”*

Whilst the learning style of the student has been strongly correlated to their engagement with TEL (Dray et al., 2011), the lecturer’s learning style is an area not previously researched. Posing this question may highlight findings which could determine the most effective delivery method for their own professional development (Canrinus et al., 2012), which conversely may influence their engagement with TEL.

To present a more in-depth understanding of the relationships between the questions, a theoretical framework and conceptual model will be postulated in the next chapter.

Chapter 3 –THEORETICAL FRAMEWORK AND CONCEPTUAL MODEL

By exploring specific research studies which focus on the changing practices involved with TEL's development and delivery that might impact on higher education institutions, this chapter will consider the underlying factors which could influence the lecturer's engagement. Three themes are identified: Digital culture; digital participation; and the final theme; digital challenges. The aim of this chapter is to provide the theoretical framework and to then outline, by the development of a conceptual model, the approach used to explore the dynamics of lecturers' engagement with technology enhanced learning.

3.1: Technology Enhanced Learning within Higher Education

3.1.1: Digital culture?

The concept of student engagement with technology which has resulted in the term 'digital natives' (Jaffer, 2010; Ellis, Bliuc, & Goodyear, 2012), implies a link between growing up with technology, and its acceptance and integration into the delivery of higher education (Lindquist & Long, 2011). Conversely, the age range of UK academics was rising in 2007/8, with findings identifying 20% as being over 55, with the under 35s decreasing to 25%; the greatest proportion of academic staff averaged at 43 years of age (Higher Education Statistics Agency [HESA], 2009). More recently, statistics indicated a slight change in trend, with the under 35s accounting for 29%, whilst the over 55s accounted for 15%; the greatest proportion of academic staff remained the same with the average at 43 years of age in 2010/11 (Higher Education Statistics Agency, 2012). The latest statistics, for the year 2013/14, offer little change, with the under 35s accounting for 30% of all academic staff, and the over 55s remaining static at 15% (Higher Education Statistics Agency, 2015). The greatest proportion of staff, 17% (22,210) average at 33 years of age. Taking into account that 70% of staff in 2013/14 were over 35 years of age, suggests that the majority of academics will not be digital natives. Web 2.0 technologies did not fully emerge until 2002, the exposure in academics everyday lives, to the culture of technological advancement could therefore be compromised.

The reality therefore is a mismatch of student expectation and lecturer know-how which Robin et al. (2011) summarises as a dramatic difference between the use of, and attitudes towards, technology. Young people who were born into a digital world and speak the language of technology fluently, as a native tongue, are the students of today who expect their education to reflect these levels of technology integration. Table 3.1 below presents, from the Higher Education Statistics Agency (2015), the age range of university students, indicating that the vast majority of those studying full time are between the ages of 18 and 25; the so named 'digital natives' (Prensky, 2001).

Table 3.1: Percentage of first year UK domiciled undergraduate students by age, level of study and mode of study 2012/13

	First degree			Other undergraduate		
	Full-time	Part-time	**Total**	Full-time	Part-time	**Total**
18 and under	52.3%	2.3%	**45.2%**	24.1%	4.8%	**8.0%**
19	19.7%	2.7%	**17.3%**	15.1%	2.1%	**4.3%**
20	7.3%	3.6%	**6.8%**	8.1%	2.2%	**3.2%**
21-24	10.1%	17.7%	**11.2%**	20.7%	11.6%	**13.1%**
25-29	4.1%	19.3%	**6.3%**	11.1%	15.6%	**14.9%**
30 and over	6.4%	54.4%	**13.2%**	20.8%	63.7%	**56.4%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

For the lecturer, engagement with TEL, based on evidence indicating a disparate age range, with 70% being over 35 years of age (HESA, 2015), could be indicative of 'digital immigrants'. Digital immigrants, a term coined by Prensky (2001) describes those who learned to use technology after finishing a formal education without continuous access to computers. Although most now use digital technologies, it is suggested that they do so 'with an accent', typical of someone who has learned a new, second language as an adult.

Conversely, a smaller number of adults, including many educators and health care professionals, have been described as 'digital settlers' (Palfrey & Gasser (2008). The term describes those adults who were not born into the digital age but who nonetheless live in a digital age. And, finally, there is another group,

described as the ‘traditionalists’, who have grown up without technology and have not embraced it as a core part of their teaching (Robin et al., 2011).

Whilst empirical evidence, utilising Prensky’s (2001) classification, is scant in relation to which categories academics fall into, anecdotal evidence, from my own practice and from colleagues in similar roles within other HEIs, provides insight into the challenges that some academics experience when engaging with TEL. Recognising that dissimilar age ranges may impact on their engagement with TEL could be of significance. Similarly, acknowledging that whilst a high proportion of higher education students are between the age range of 18 and 25 years, there is a growing proportion of mature students. Many of these mature students are studying part-time, combining studying with work commitments, and as such may not be “digital natives”. Unfamiliarity with the use of technology, which is increasingly being used within contemporary health care delivery, could therefore be of significance to academics when developing online learning resources (DH, 2011).

Within the health science sector, short courses are increasingly being offered to health care professionals. Whilst the age range of those accessing this form of education is not readily available, Thorpe and Edmunds (2011) acknowledge that, in their qualitative research study, the majority of their students were over 30 years old, and in most cases studying part-time whilst in employment. Thirty students, including part-time healthcare students with an age range of 30-50 years, took part in the study which aimed to identify and explore the ways in which technology played a role in connecting between university study and workplaces, work experiences and work practices. Students were invited to participate, by interview, at the beginning, middle and end of their module. Students were encouraged to express their own perspectives freely in relation to unpublished topic areas, and to make connections between their use of technology and their work, career and social life. The findings, for one mature student, highlighted the challenges, but equally the importance, of being conversant with technologies within the health care environment, stating that online risk assessment was not so daunting now that the skills of communicating in an online forum had been mastered. Lyndon and Hale (2014) undertook quantitative research to explore how the blended use of a virtual learning environment (VLE), in one university, impacted on student learning. Forty-seven students participated, with an age

range of 20 – 50 years. Conversely, they reported habitual and motivational issues, such as lack of ability or experience, as barriers to engagement with discussion forums on the VLE, with one student stating, ‘sorry but online forums are not my thing – maybe I’m too old!?’ (p.62).

Encouraging all the healthcare workforce, regardless of age or exposure to prior technology, to engage with technology, is therefore crucial for lecturers, as without their engagement, the delivery of education, which utilises technology, will not address this mismatch.

Pajo and Wallace (2001), undertook research within one higher education institution in the United States of America (USA) utilising a quantitative survey which included responses from 180 lecturers. The survey revealed a strength in that the age demographic of lecturers is similar to those in the UK, with the majority being over 50 years of age. Whilst their research explored barriers to the uptake of TEL, there was no correlation recorded to the age range of the respondent. The number of years that academics were in service in HE, as an influencing factor relating to the uptake and usage of web-based technologies was recorded, but not utilised or published within this study. The relatively small sample size of 180 respondents in Pajo and Wallace’s quantitative study, and the limited range of technologies since this research was conducted, highlight further limitations of this study (2001).

Understanding the culture of the organisation and its impact on individual academics’ involvement with technology is difficult to ascertain. Ahlgren and Tett's (2010) case study research, which aimed to raise awareness of identity and organisational culture within 14 workplace environments, nevertheless suggests that employees working in an expansive organisational culture, such as an HEI, are part of an environment where they are encouraged to learn. How they are encouraged however, is not clear, although what is apparent is that learning is seen as being part of how an individual elects to engage in workplace activities. Rovai, in an earlier quantitative research study (2002), attempted to identify cultural impact within students studying Information Technology (IT) courses in one educational institution in the USA. The study, which included 375 participants, identified two key themes; connectedness and learning. “Connectedness” represented the feelings of the community regarding cohesion, spirit, trust, and

interdependence. “Learning” represented feelings regarding interaction with others, and the degree to which values and beliefs are being satisfied. Despite the limiting factor of a student population, the findings presented a conceptual framework for understanding sense of community, which demonstrated strength of internal consistency in relation to connectedness and learning.

Whilst the themes of connectedness and learning reflect an individual’s commitment to learning, how organisations support learning is not so clear. Schneckenberg (2009) recommends that universities gain an active role in defining their institutional goals, although conversely, Kirkwood (2009) argues they are already in place, but not implemented. Kirkwood suggests the problem, is that high-level policy statements and institutional strategy documents make claims about the impact of technologies upon learning, often with little or no supporting evidence and insufficient understanding of the complex relationships involved (2009). Mansvelt, Suddaby, O’Hara, and Gilbert (2009) concur, highlighting that although specific policies relating to the development of eLearning are in existence in some universities, alignment between policy and practices across all organisational levels are not always evident to staff. Regrettably, there is limited research which focuses on institutional policy and TEL adoption issues, although policies that enable and even encourage engagement with TEL can, according to Czerniewicz and Cheryl (2009), and Smith and Macdonald (2015) strengthen a university’s commitment to improve student learning. What is clear is that policy statements should identify the organisation’s goals, values, and resource availability, they should clearly outline what support, structures and systems are available, and importantly, they should be workable (Czerniewicz & Cheryl, 2009; Graham, Woodfield, & Buckley Harrison, 2013; Robin et al., 2011).

3.1.2: Digital participation?

Digital natives, it could be said, are accustomed to the skills required to use a computer. Saeed et al. (2009), whilst agreeing with this concept, conducted an online survey of 204 students who were studying for a Master’s degree in IT at one American university, to establish a link between computer skills and preference in relation to individual learning style. Although this quantitative study was limited by a relatively small sample size, the findings were of interest as they

confirmed positive and negative correlations between learning style of the student and preference of 'technology'. The learning style inventory (LSI), giving strength to this quantitative research, was the Felder and Soloman (1993) Individual Learning Styles (ILS) questionnaire which has a proven significant record within IT educational research for reliability and validity (Felder & Spurlin, 2005; Zywno & Waalen, 2002). Whilst no one teaching method employed by lecturers will effectively reach all students, the implication is that, as a lecturer, you cannot address all learning styles all of the time, and therefore must present material that embraces all styles and encourages all to participate. Zywno and Waalen (2002) and Saaed et al. (2009) agree that within online education the correlation is strong enough to support the strength of learning style identified by individual students.

Whilst a correlation between learning style of the student and teaching style of the lecturer has been explored, the learning style of the lecturer has not been considered in relation to the reason why lecturers do not change their style of teaching, or engage with online learning and teaching. If, as suggested by Artvinli (2010), lecturers used a variety of teaching styles to effectively address the learning styles of students, then a correlation to determine the relationship between the lecturers' own learning style, their teaching preference, and their adoption of TEL, could be of interest to employing HEIs. Teaching styles or preferences are the leading factors that shape and assure the success of a highly complex teaching-learning process (Artvinli, 2010).

The teaching style of the lecturer proves to be an interesting point in relation to technology enhanced learning. Researchers have previously identified a correlation between the teaching style adopted by lecturers for the delivery of a named subject matter, and although this was unrelated to healthcare provision, it was measured across a number of different higher education institutions (Norton, Richardson, Hartley, Newstead, & Mayes, 2005). Probably of more interest are the findings which suggest that lecturers' concepts of teaching, fail to develop with experience or training (Richardson, 2005). What appears to be identified however, is that the style adopted for online delivery often mirrors the style the lecturer adopts for face to face teaching (Trigwell & Prosser, 1996; Kirkwood, 2009). Despite the proliferation of published research promoting the potential of technologies for learning and teaching, more recent evidence concurs suggesting that lecturers' practices rarely change with time (Kirkwood & Price, 2011a). Blin

and Munro (2008); Price, Richardson, and Jelfs, (2007) coined the term 'non-transformation', suggesting that teaching practices, when incorporated into an online medium, are not influenced by any pedagogical change.

Kember (1997) identified, from an extensive literature review of published research, five teaching styles utilised by higher education academics. The findings, resulting from qualitative analysis of 468 taped interviews, were themed along two dimensions as can be seen, in Table 3.2 below. Whilst this review of literature is somewhat dated, these same five themes have more recently been reviewed and supported by Richardson (2005), with reliability and internal validity being confirmed in qualitative studies undertaken by Postareff et al's. (2008) report, from 97 university lecturers, and Stes and Van Petegem's (2012) findings, from 30 higher education lecturers.

The five teaching styles identified were lecture, problem solving teaching, group discussion, problem based learning and enquiry based learning. Ranging from a learning-focused approach of facilitating the students' learning processes, to a content-focused approach, where the teaching of students who are considered to be more or less the passive recipients of information, these key styles were utilised within Stes and Van Petegem's more recent research (2012).

Table 3.2: Conceptions of Teaching (Kember, 1997, p. 262).

DIMENSION	Lecturer	Teaching	Student	Content	Knowledge
Imparting information	Presenter	Transfer of information	Passive recipient	Defined by curriculum	Possessed by lecturer
Transmitting structured knowledge	Presenter	Transfer of well-structured information	Recipient	Lecturer needs to order and structure material	Possessed by lecturer
Lecturer - student interaction	Presenter and tutor	Interactive process	Participant	Defined by lecturer	Discovered by students within lecturer's framework
Facilitating under-standing	Facilitator	Process of helping students to learn	Lecturer responsible for students' learning	Constructed by students within lecturer's framework	Constructed by students
Conceptual change	Change agent/ developer	Development of person and conceptions	Lecturer responsible for student development	Constructed by students; conceptions can however be changed	Socially constructed

The research framework employed by Stes and Van Petegem (2012), built on Kember's (1997) research by drawing on the Approaches to Teaching Inventory (ATI) first published by Prosser and Trigwell in 1999, and aimed to map out teaching approaches utilised in higher education. The ATI was delivered to 1855 higher education academics in Stes and Van Petegem's (2012) mixed methodology research, yielding an initial response from 377 lecturers who completed a quantitative online survey, 30 of whom then volunteered to take part in qualitative interviews. The findings corroborated previous studies in that half of the lecturers' profiles were classed as 'dissonant', which the researchers associate with poor teaching, high workload and less clear goals. Whilst these findings give strength to the classification of teaching approaches, they are limited by non-exploration of the culture of the organisation, the subject area being delivered, and the medium of delivery.

Interestingly, Kember (1997) suggested that the faculty members' teaching approach is a reflection not just of them as individuals, but is balanced from their department and the institutional pressures of their employing organisation. Kirkwood and Price (2011a; b) agreed, reporting that even the most reformed and innovative lecturer can be constrained by the departmental or institutional context, particularly when attempts are made to support learning and teaching with technology.

3.1.3: Digital challenges?

Although online education makes use of new technologies, embracing new technologies can be challenging for some academics in relation to the new skills which may need to be learned. Goodhue and Thompson (1995) built on the work of Davis's (1989) Technology Acceptance Model (TAM), and DeLone and McLean's (1992) Taxonomy of Information Systems, to develop the Technology to Performance Chain Model (Figure 3.1). This model has subsequently been used extensively by researchers in pursuit of student experiences of skills they require to undertake online learning and teaching (DeLone & McLean, 2003; McGill & Hobbs, 2007; Cheng, 2011).

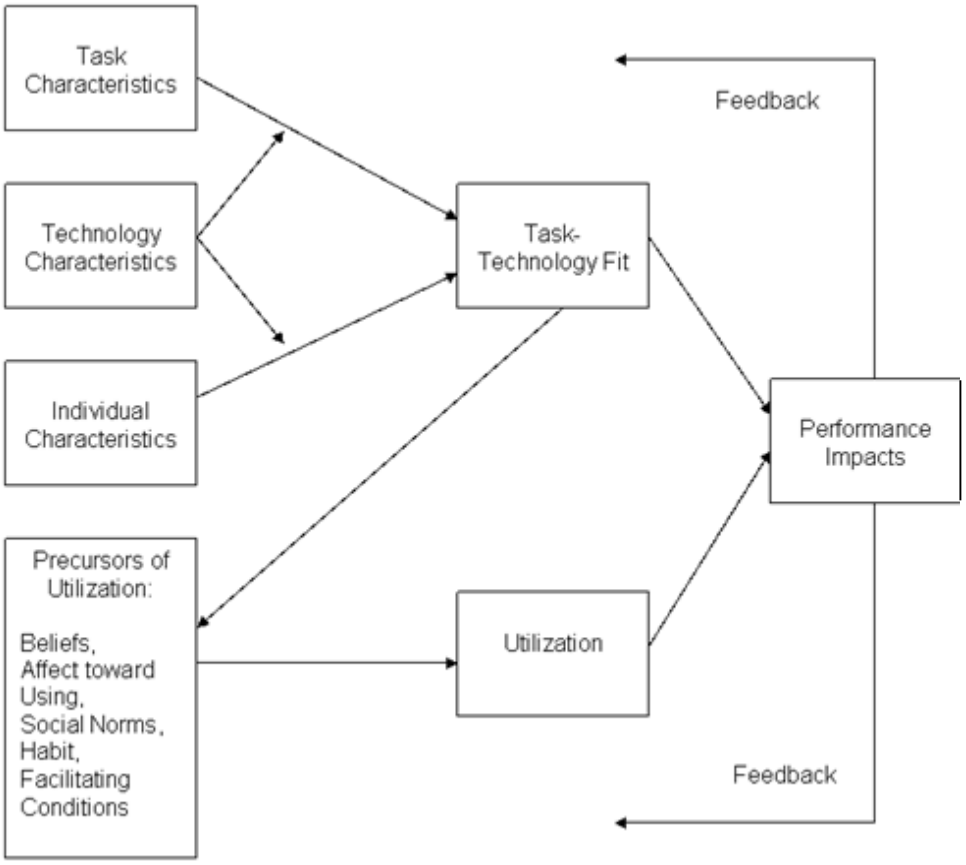


Figure 3.1: Technology-to-Performance Chain Model
(Goodhue & Thompson, 1995, p. 217)

Teo, Lee, and Chai, (2007) isolated various elements of the technology to performance chain model framework to explore lecturer relationships with technology. Their quantitative study was conducted well, highlighting strengths relating to the usefulness of technology in teaching, as well as ease of use. The major limitation of the study, was that the 239 participants surveyed were all prospective teachers (undertaking teaching training courses), they could all be considered as 'digital natives', and could therefore be perceived to have had advanced skills and knowledge on the use of computers. Reporting findings from quantitative research which surveyed 152 high school students Joo et al., (2000) and Barbeite and Weiss (2004), in their quantitative survey of 612 members from a standing research committee, offered further validated evidence relating to the isolated factors of computer utilisation, online self-efficacy and computer anxiety, both of these studies recruited respectively, students and non-academics, the limitation therefore is the non-inclusion of lecturers/academics.

The importance of facilitating conditions within the Technology to Performance Chain Model was reflected in DeLone and McLean's addition of service quality to their updated model (2003). Facilitating conditions refers to factors that are present in the work environment that exert an influence over a person's desire to perform a task (Teo et al., 2007). What those factors are however, is not clear, although evidence would suggest that the working environment does forms part of the organisational culture (Ahlgren & Tett, 2010), and as such could relate to the influence of local policy (Czerniewicz & Cheryl, 2009). Whilst the definitions are not clear-cut, what is of interest is that in McGill and Hobbs' (2007) quantitative report from their institute wide survey of 267 students and 67 lecturers, that facilitating conditions did not appear to be a major issue; as the perceived levels of facilitating conditions were generally high. The generalisability of this finding however, was limited due to the inclusion of only one university.

Further developments to the Technology to Performance Chain Model isolated individual factors that could inhibit or enhance the adoption of a technological innovation, these same factors have been uniquely compared to the parallels of Rogers' Diffusion of Innovation Model (Duan, He, Feng, Li, & Fu, 2010). Rogers (2003), distinguished five categories of adopters of an innovation: innovators, early adopters, early majority, late majority, and laggards (Figure 3.2).

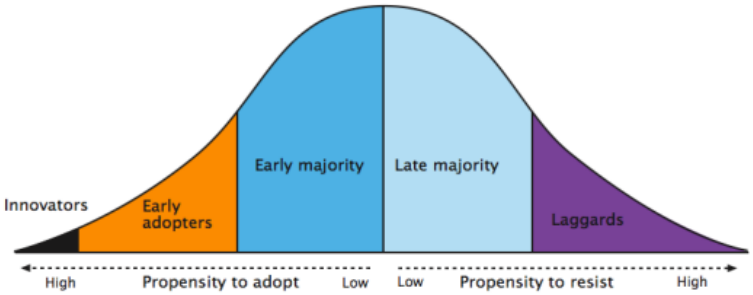


Figure 3.2: Rogers Diffusion of Innovation Adoption Theory (2003, p. 281)

All five categories have been usefully employed within educational research (Gilbert, 2011; Yuen, Yaoyuneyong, & Yuen, 2011; Sahin & Thompson, 2007; Salaway, Katz, & Caruso, 2006; Smith & Caruso, 2010), with the term 'early adopters' being frequently associated with the uptake of technology enhanced learning within education (Govender & Govender, 2009; Heaton-Shrestha, Edirisingha, Burke, & Linsey, 2005; McGill & Hobbs, 2007). Although the

challenge of adopting new technologies continues to be evident within the literature, few studies, as shown in Appendices B and C, have focused on higher education establishments, with limited evidence of these areas being explored within the United Kingdom.

Whilst innovation diffusion can be seen as becoming an increasingly popular reference theory for empirical studies of information technologies (IT), the challenge of choosing suitable technologies for online tasks has been a constant feature within the literature (McGill & Hobbs, 2007; Shah & Cunningham, 2009). The 'task-technology fit' (Goodhue & Thompson, 1995), recognised that technologies must be utilised and fit the task they support in order to have a performance impact. To identify the levels of fit between the tasks students and lecturers need to perform, and the technology being employed, McGill and Hobbs (2007) conducted quantitative research, in which 267 students plus 67 lecturers from one Australian university took part in an online survey. The perception of the lecturers' engagement with the use of the technology in online learning, was occasionally reported as being to the detriment of the students' engagement with technology and student expectation. The study highlighted, albeit on a small scale, limitations due to only one university being included, and a mismatch between lecturer engagement with technology and student expectation.

Compounding the task-technology fit are aspects of work motivation (self-efficacy); beliefs and personal values held by the lecturer with respect to the embrace of digital challenges. Furnham, Forde and Ferrari (1999) highlighted a correlation from their quantitative research, between work motivation and job satisfaction, implying that managers needed to address the challenges staff raise in order to effect a more productive working environment. Whilst a relatively small survey, including 92 job applicants, the findings, although not generalisable due to low recruitment, confirmed acceptable reliability. Work motivation, explored by utilising the theories proposed by Maslow (1954) and Herzberg (1959), cited by Gawel (1997, para.13), has continued to emerge and yet research on lecturer motivation is sparse. Govender and Govender (2009) explored the relationship between lecturers' engagement with technology and their own self-belief by measuring lecturer use, student use and overall use of technology in the classroom. Interestingly this quantitative research highlighted that 85% of lecturers (n=1,222) were not using computers in their teaching, leaving the

researchers to conclude that negative feelings and lack of interest in professional development was linked to low levels of self-efficacy. Their survey, whilst robustly executed, was distributed to 93 secondary schools; the weakness of the study therefore is the generalisability of findings to university lecturers.

Conversely, in an attempt to address unanswered questions concerning learning styles, Dunn's (1984) published manuscript, whilst not directly reporting empirical findings, draws together conclusions, from previous quantitative and qualitative research, which suggests that cognitive processing of a specific topic, is affected by motivation. Whilst the paper gives a strong indication that motivation to engage in teaching and learning could be indicative of a defined learning style, the findings are limited due to the lack of robust empirical evidence.

3.2: The Emergent Theoretical Framework

From the research studies reviewed, the key areas of interest explored within this study, are presented as an emergent theoretical framework, shown in Appendix C, to feature isolated variables/factors and study group populations.

3.3: Conceptualising Engagement in Technology Enhanced Learning

Based on the purpose of the study, and the results of reviewing relevant literature which emerged as the theoretical framework (Appendix C), a conceptual model, shown on the next page as Figure 3.3, was developed to guide the research.

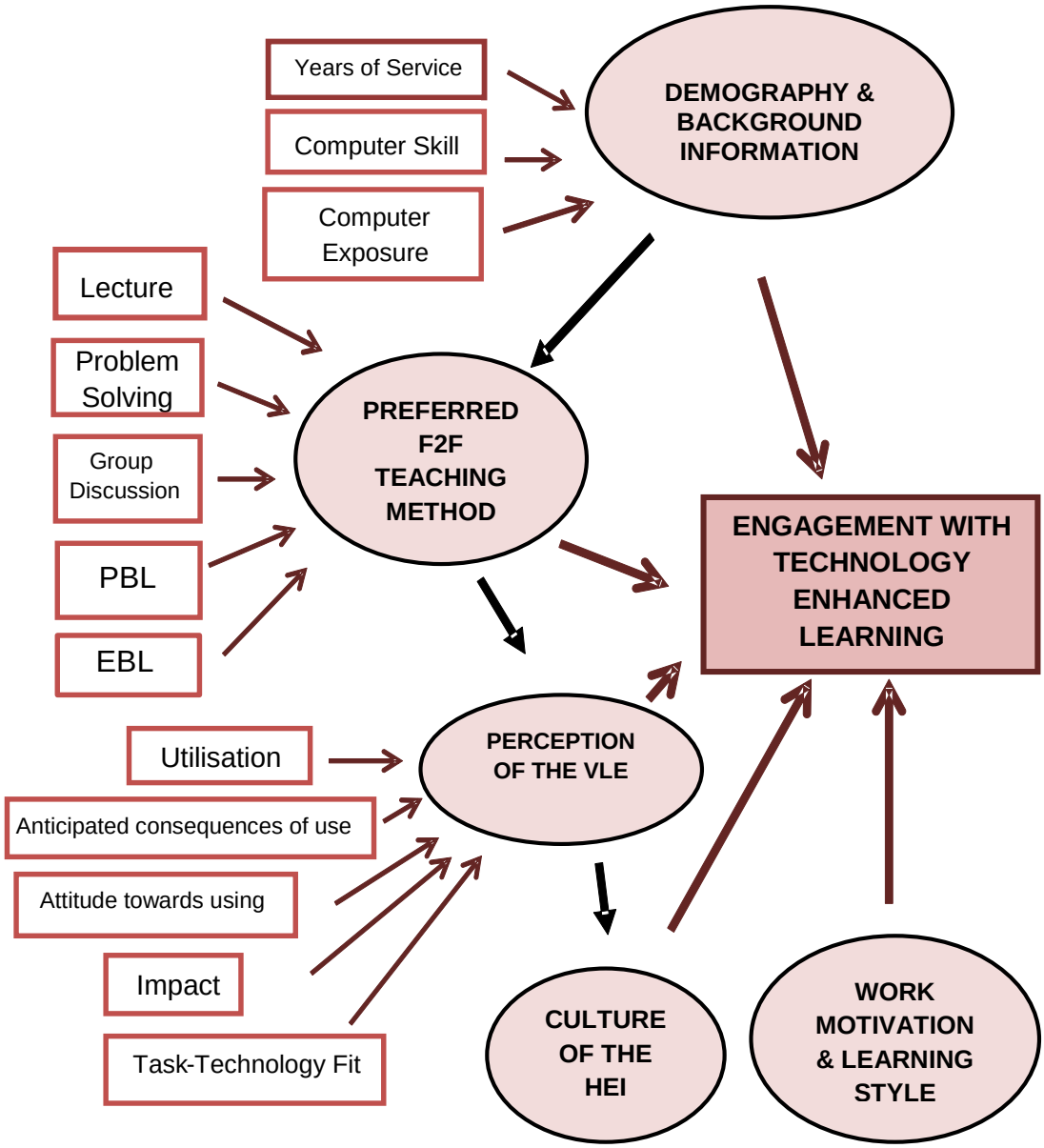


Figure 3.3: Conceptual model of engagement with technology enhanced learning

To explore the dynamics of lecturers' engagement with TEL, five interrelated topic areas were included, namely: Demography (or characteristics of the population) and Background information; Preferred face to face teaching method; Perception of Virtual Learning Environments; Culture of the higher education institution; and Work motivation and learning style.

The model proposed five related concepts:

1. **Demography and Background information**; generally referred to as the characteristics of a population, which, when studied, can illustrate the changing patterns of that population over a period of time (Inan & Lowther, 2010; Setterstrom, Pearson, & Orwig, 2013). The purpose of measuring the number of years' service in Higher Education, along with the lecturers' computer skills and exposure, was to explore if these demographic factors had an influence on the lecturers' engagement with TEL. Number of years' service in higher education was opted for rather than age range, as predictably the age range of UK academics is rising, with the latest findings identifying 42% as being over 45 years of age (Higher Education Statistics Agency, 2015). Years in service in Higher Education influences uptake and usage of web technologies according to Pajo and Wallace (2001). The range of technologies vary, from the use of discussion forums in online environments, through to interactions using wikis, blogs and podcasts (Saeed et al., 2009), with uptake being noted as either relatively easy or having the capacity to cause considerable anxiety (Gattiker & Hlavka, 1992). Combining these three areas uniquely demonstrates the demographic foundations underpinning engagement with TEL i.e.: how long a lecturer has been employed in HE, years of service; the lecturer's reported computer skills; and, the specific technologies utilised for online learning and teaching.

2. **Preferred Face to Face Teaching Method**: Lecturers adopt different approaches to teaching, which Kember (1997) and Richardson (2005) suggested are converged as five different conceptions, which once adopted rarely change, even with increasing teaching experience. The purpose of measuring 'face to face' preferred teaching approach was to establish whether the underpinning pedagogy associated with online learning and teaching was positively correlated to the lecturers' preferred approach to face to face teaching and their engagement with TEL. Exploring which web technologies the lecturer employs; their computer exposure (Saeed et al., 2009), as highlighted in the demography and background information area, may also demonstrate a relationship to

preference of teaching method, and their engagement with TEL. Likewise, their attitude towards using a VLE for computer based educational activity (Gilbert, 2011; Yuen et al., 2011); and their perception of the VLE, may also be associated to their preference of teaching method, and as such affect engagement with TEL.

3. **Perception of the VLE**: Originating from the precursors of utilisation as described by Goodhue and Thompson (1995), and as illustrated in Figure 3.1 (p. 34), this topic area relates to participants' use of VLEs and individual performance. Users of technologies, in Goodhue and was perceived to be more useful, more important, and gave them a relative advantage Thompson's research, were specifically asked to rate their beliefs in relation to whether the online information system they used when compared with receiving information via non-electronic means (1995). The technology to performance chain model asserted that in order to have a positive impact on individual performance, the technology must firstly be used, and must be fit for the purpose it was intended. Whilst task-technology fit is important, and has been isolated for exploration in the research undertaken by McGill & Hobbs (2007) ignoring the precursors of utilisation may well, if researched further, explain what contributes to, or impairs technology usage (Junglas, Abraham, & Ives, 2009). The precursors of utilisation, framed as 'Theories of Attitudes and Behaviour' in Goodhue and Thompson's research (1995) and itemised under the headings of: beliefs; the affect towards using; social norms; habits of the user; and the facilitating conditions, were not empirically reported. Subsequent empirical studies however do isolate precursors of technology utilisation, for example, the user's confidence in using computers (Joo et al., 2000); utilisation, and the anticipated consequences of using computers, which Barbeite and Wise (2004) describe as an affective response which has a direct influence on self-efficacy beliefs. In turn, self-efficacy is related to task performance demonstrating a strong relationship to actual behaviour and level of performance. Gilbert (2011) built on Rogers Diffusion of Innovation Adoption Theory (2003) to isolate lecturers' personal attitude towards online learning and teaching, which Goodhue and Thompson (1995) termed as 'affect towards using'. Lastly, Blake

(2009) and the JISC/UCISA (2003) isolated the barriers which lecturers reported as having an impact on their engagement with TEL. Noted as precursors to utilisation, these areas consistently feature within the literature (Brown, 2012; Reed, 2014), and if unaddressed, may continue to impact on lecturers' future engagement with TEL.

4. **Culture of the Higher Education Institution**: Organisational culture as it relates to lecturer support, organisational structures and systems is repeatedly highlighted as having an impact on lecturers' engagement with TEL (Czerniewicz & Cheryl, 2009; Graham et al., 2013; Robin et al., 2011), and as such is a facilitating condition which could impact on future engagement. Described in the technology to performance chain model (Goodhue and Thompson, 1995), a facilitating condition is a precursor of utilisation within the area of Perception of the VLE. Rovai (2002) published empirical evidence suggesting that lecturer support manifests as a sense of 'connectedness' and 'community' within the work organisation. Organisational support, as it relates to the culture of the HEI, takes into account the support available from colleagues, and the available support from the organisation.

5. **Work motivation and learning styles**: When change, such as the introduction of online learning and teaching, in any format is introduced, there is an expectation that adjustment will occur. Uncomfortable experiences however, are unavoidable, particularly if faced with uncertainty of role and or responsibility. Discomfort level however, may decrease as an adjustment, for example, an engagement with learning occurs. Dunn's (1984) extensive literature review of learning styles suggested that there are several influential factors in learning, these include environment, emotion, sociology, physiology and psychology. The area of emotion recognises the importance of motivation on learning (Dunn & Honigsfeld, 2013). Schneckenberg & Wildt (2006) go further and suggest that if no motivation to change is demonstrated, then no action will occur. The integration of the latter bodies of literature is to be synthesised as empirical evidence of such relationships is scarce. The purpose of

combining learning styles (Felder, Litzinger, Lee, & Wise, 2005; Felder & Soloman, 1993; Litzinger, Lee, Wise, & Felder, 2007) and work values factors (Furnham et al., 1999; Furnham, Eracleous, & Chamorro-Premuzic, 2009), is therefore to investigate relationships, if in existence, that might influence engagement with TEL.

3.4: Aims and Objectives

Building on existing theoretical frameworks, a conceptual model has been devised to inform the study process, this includes the choice and execution of the research methodology adopted. The overall aim is to explore the associated factors and dynamic relationships between lecturers' engagement with TEL.

The objectives of this study are to

1. Design and develop a data collection tool based on the review of empirical studies.

2. Test the reliability and validity of the data collection tool and modify according to the findings.

3. Examine, through quantitative enquiry, the dynamics of UK wide Higher Education Institution (HEI) lecturers' engagement with TEL within Health Science Sectors:

    3.1 Investigate the potential reasons why some lecturers engage, whilst some do not, with the processes employed to support the development of online learning;

    3.2 Ascertain whether relationships and associations exist between the lecturers' level of engagement with TEL, and computer skills and exposure: including the use of web 2.0 technologies, motivation and individual learning style;

3.3 Explore lecturers' growth and development in relation to their use of technology, in order to identify the enablers and barriers impacting on their engagement with TEL;

3.4 Explore the relationship and association between the cultural environment of the educational establishment and its influence on the lecturers' engagement with TEL.

3.5: Summary

The literature presented provides a theoretical framework, which through a conceptual model, has the potential to underpin the development of a data collection tool for researching the dynamics of lecturers' engagement with technology enhanced learning. The basis of the model is the understanding that engagement with TEL is highly complex, drawing on many different factors. Research explored within the literature identifies limitations which, in summary, neglect on the whole, the views of academics from the entire population of the Health Science education providers in the United Kingdom. From this, there is a need to expand findings by combining the key areas in a unique way, and, widen participation by including all lecturers within Health Science education faculties in UK universities.

The study intends to explore the dynamics of lecturers' engagement with TEL, to identify factors including growth and development, and relationships and associations impacting on behavioural change. The results could potentially provide guidance for staff support and provide employers with a structured approach to future staff development programmes. These same factors, if isolated, could be used to determine future selection of academics, and benchmarks for institutional promotion as recommended by the HEFCE (2011).

The following chapter will describe the accomplishment of the objectives through the research methodology, survey instrument development and piloting of the data collection tool.

Chapter 4 – METHODOLOGY

Introduction

This chapter outlines the research methodology of this study by presenting the specific features of undertaking research using surveys and providing an exposition of the views about the nature of knowledge i.e., epistemology and the nature of reality i.e., ontology, underlying this approach.

The research strategy adopted was to undertake survey research at Health Science education faculties[1] within the United Kingdom, the target population was identified as lecturers engaged in the development or delivery of online learning.

The chapter is divided into three sections: the first section considers surveys as a research enterprise; the second section explores the survey instrument development. The final section focuses on the testing of the survey data collection tool and includes the concepts of validity and reliability, and acknowledgment of ethical approval to conduct the study. The chapter concludes with a summarised discussion of the survey findings.

4.1: The Survey Research Approach

In determining the research approach there are certain standards and rules that guide a researcher's actions and beliefs in relation to the nature of knowledge: ontology; epistemology; and methodology. Conducting research to explore the factors that affect lecturers in their engagement with technology enhanced learning, means exploring those factors that, within professional practice, have been personally experienced. It represents an opportunity to explore reality through others: the research participants. Understanding the philosophical

[1] Many Faculties of Nursing have merged with other non-medical professions to become Faculties of Health Sciences (or similar), and whilst the Doctorate originally pursued, related to nursing, this population would be difficult to elicit, the Doctorate pursued therefore was deemed to be more appropriate within a Health Sciences domain. The population includes all non-medical professions.

standpoint enables the research methodology to be designed in congruence with the researcher's own ontological and epistemological stance.

Ontology is the study of beliefs dealing with the nature of reality and being (Steenhuis & de Bruijn, 2006). This is how I, as a researcher, see the world in which I attempt to develop new knowledge. In terms of ontology, adopting a positivistic research approach would suggest that there was an independent or objective truth waiting to be discovered, and as such this would involve researching the truth. Epistemology is the study of beliefs about the origin and acquisition of knowledge, dealing with the relationship between researcher and research object (Cresswell, 2013), the implication being that knowledge is, 'hard, objective and tangible' (Cohen, Manion, & Morrison, 2008). The researcher can be separated from the object under study, and can therefore distinguish between knowledge and belief, and determine what can be known reliably, or indubitably, and that which cannot. A positivist epistemological assumption emphasises the pursuit of objective truth through investigation (Lawal, 2009, p. 56). The philosophical paradigm, positivism, is the traditional scientific or quantitative approach, often referred to as the gold standard (Denzin & Lincoln, 2005; Parahoo, 2006; Polit & Beck, 2014). Positivism gives importance to research methods focusing on quantitative analysis, surveys, and experiments (Weaver & Olsen, 2006), dealing with how knowledge is gained about the world, measuring variables such as traits, characteristics or other attributes. Whilst surveys can be considered to have a non-experimental design (Totten, Panacek, & Price, 1999), they do have commonality with true experimental or quasi-experimental type studies. Therefore, when looking at methodological approaches, surveys tend to fit more conveniently into positivist research approaches, although they might be designed to generate qualitative and quantitative data, irrespective of the underlying paradigms (Lawal, 2009). Crossan (2003) argues that the distinction between quantitative and qualitative methodology is sometimes over-emphasised.

Denscombe (2010) suggests that the survey approach is a research strategy, not a research method, but as with any research study the approach must be appropriate to the subject area being explored. Conversely Steenhuis and Bruijn (2006) suggest that survey research within the positivistic paradigm, should be concerned with the objectivity of the survey instrument, an appropriate selection

of respondents, and the correct application of statistical methods to determine the significance of the findings. Interestingly, Denscombe advocates that there are certain methods which do sit more comfortably with surveys (2010).

The positivism research philosophy was utilised to guide this study by employing a highly structured methodology (Cresswell, 2013) achieved by using an objective and un-biased survey instrument . A deductive approach was employed to determine the dynamics of participants' engagement with TEL in the context of their employment within HE. The survey research strategy complements well with the adopted research philosophy and approach, as it allows the researcher to collect quantitative data through a structured questionnaire from a sizeable target population (McBurney & White, 2013). Survey, as a form of positivist research, is informed by empiricism; the facts are said to speak for themselves, by presenting standardised information obtained through value-free methods (Polit & Beck, 2013). There are however, difficulties in determining borders of knowledge in survey research, the measurement of truth might not be objective, and as such is not a guarantee of truth. As a researcher, isolated from the respondents, I have no control over the respondent and their completion of the survey, but hope, that by researching subjects from similar professional backgrounds, that truth prevails in their responses.

Survey research, according to Kelley, Clark, Brown, and Sitzia (2003) is common in studies of health and health services, particularly when aiming to obtain a representative picture of a large population (Check & Schutt, 2012). The term ‘survey’ is used most often to describe a method of gathering information from a sample of individuals by asking questions to determine relationships and associations between variables; this sample is usually a representative fraction of the population being studied. All research starts with an all-important research question; surveys are no different in that a well-articulated research question should identify that survey study design is the most appropriate way of obtaining the data to best answer that question (Panacek, 2008).

A model predicts the expected relationships and associations among the independent and the dependent variables from which the survey is then constructed. Glasow (2005) clearly identifies the differences between surveys and survey research advocating that to distinguish the difference even further,

the term survey instrument should be used instead of survey – the survey instrument therefore supports the survey research.

Gathering information at a single point in time is described as descriptive research; a cross-sectional survey (Kelley et al., 2003). The aim of this research was to explore the associated factors and dynamic relationships between lecturers' engagement with TEL within Higher Education institutions across the UK at one point in time. Descriptive studies are used to describe associations and relationships; the objectives of the study, as listed in Ch. 3, p. 42-43, were to investigate, through the use of a survey instrument, the associations and relationships between items within five discrete areas/dimensions, and the dependent variable; lecturers' engagement with technology enhanced learning.

Summary: Within the positivist paradigm, the researcher who plans to conduct experimental research needs to be able to develop questions or hypothesis based on previous research. The goal is to add to the body of knowledge by providing empirical evidence to answer the research questions posed.

4.2: Survey Instrument Development

Survey research often involves large samples, and statistical generalisations where the researcher and respondent are considered independent. In many instances surveys are oriented towards hypothesis testing through statistical correlations. Using surveys for descriptive statistics purposes, as in this study, is also possible. Survey research is efficient in that many variables, and their relationships, can be measured to quantitatively describe specific aspects of a given population. In the context of this study, where a large population was to be included, survey research is the only feasible approach for developing a representative account of factors which may or may not impact on the lecturer's engagement with technology enhanced learning. Such an approach would need to be tested by involving lecturers engaged with the development of technology enhanced learning, particularly as this sample would be more likely to produce statistically significant results. Before conducting the survey, the researcher must predicate a model that identifies the expected relationships among these

variables (Figure 3.3: Ch. 3, p. 38). The survey instrument is then constructed to test this model.

The design and development of the survey instrument took place in five distinct stages.

Stage 1: Firstly the theoretical framework was created through the examination of existing literature, with themes and concepts that wherever possible had been validated in previous research surveys (Appendix C).

Stage 2: Secondly, as shown in Table 4.1, some of the questions identified from previous research, were modified, omitted (if deemed unnecessary or outdated), or adapted from existing survey instruments for use in this study.

Table 4.1: Comparison of original items with revised item

	Original item	**Modified item**
1.2	Would you say that working with computers: *Can only be done if one knows a programming language such as 'Basic'*	Would you say that working with computers: *Can only be done if one has been trained*
1.3	Web technologies used to support online learning: *Podcast, Videos, Blog, Wiki,*	Web technologies used to support online learning: *Additions: Lecture capture, adobe connect, photographs, RSS feeds, Twitter, Skype*
3.2	I feel confident: *Starting the internet programme. Downloading necessary materials from the internet*	I want to know if you feel confident: *Starting an internet search engine. Downloading and saving files. Addition; Providing hyperlinks from the internet into emails*
3.3	Barriers to using eLearning in teaching:	What factors might impact on any development of your engagement with online learning: *Three tools synthesised to develop comprehensive questions.*
3.5	Task–technology fit: *Web CT specifically named in six questions within this section*	Task-technology fit: *Web CT modified to VLE in six questions within this section Addition: Materials can be easily updated*
6	Classroom community scale: *Course used in five questions*	Lecturer support: *Course modified to either faculty/department or online course/module/materials in five questions. Student replaced with lecturer*

Examples included modifying learners' engagement with TEL to lecturers' engagement with TEL, and included the addition of terms to reflect new development and usage of technologies in education. When modifying existing instruments the reliability and validity may be invalidated, Rudestam and Newton (2007) posit their acceptance of modifications providing justification is offered and a revision of the reliability and validity is undertaken.

Stage 3: Here the questions were organised into discrete focus areas within each of the survey dimensions. Where the previous research had tended to focus on either one establishment or had a predominantly student population, the aim, in this study, was to develop a more rigorous instrument by adopting a more comprehensive framework.

Dimension 1: Demography and Background Information

By combining three previously validated data collection tools respondents would be asked to firstly indicate the number of years' service they had been employed in HE (Pajo & Wallace, 2001). The second area requested lecturer's attitudes relating to working with computers using a 5 score rating where 1 = strongly disagree, and 5 = strongly agree, in order to determine attitudinal differences to computer performance and skills (Gattiker & Hlavka, 1992). The final area of dimension one invited lecturers to record, on a nominal/ordinal Likert scale, their usage of various web technologies using a five score rating scale, where 1 = never, and 5 = regularly (Saeed et al., 2009).

Dimension 2: Preferred Face to Face Teaching Method

Utilising five different approaches to teaching, identified by Kember (1977) and Richardson (2005): namely, giving a lecture; problem solving; group discussion; problem based learning; enquiry based learning, respondents were asked to indicate, on a ranking scale, their preference, where 1 = indicated their strongest preference, and 5 = their least preferred approach.

Dimension 3: Participants' perceptions of virtual learning environments

Building on the findings from five previously conducted areas of research described within the theoretical framework presented in Appendix C, a number of questions asked respondents to rank and rate their computer use, and

perceptions of virtual learning environments. Respondents were being asked to indicate on nominal/ordinal Likert scales:

1. the anticipated consequences of using computers which they perceived to cause them anxiety; these were measured along a range where 1 = strongly disagree, through to 5 = strongly agree, examples included ‘working with computers would make me feel nervous’ and ‘computers make me feel uneasy and confused’ (Barbeite & Weiss, 2004), and
2. their confidence in using various functions associated with operating a computer (Joo et al., 2000): these were measured along a range, with 1 = not at all confident, through to 5 = totally confident, statements of computer functions included ‘from starting an internet search engine’ and ‘downloading and saving files’; and
3. the impact of their engagement with TEL through the perceived barriers associated with their adoption of eLearning (Blake, 2009); barriers to their use of online teaching technologies (Pajo & Wallace, 2001), and their HE institutions’ barriers to their engagement with online learning (JISC/UCISA, 2003). Measurement ranged from indicating strong disagreement = 1, through to strong agreement = 5, against statements including ‘time required to learn how to use the technology’, ‘don’t think it enhances student learning’, and ‘lack of academic development’, and
4. their personal attitude towards online learning and teaching (Gilbert, 2011). This question included statements relating to their ‘scepticism of using new technologies’, and whether they were ‘the first to experiment and use new technologies’. Respondents would be asked to identify which one, out of five given statements, summarised their own personal feelings about using VLEs., and finally, one further question which would ask respondents about:
5. using a virtual learning environment to support module delivery by identifying task to technology fit (McGill & Hobbs, 2007) along a range where 1 = strongly disagree, through to 5 = strongly agree. Statements included ‘the VLE is easy to use’, and ‘materials can easily be updated’

The purpose of combining these five areas was to measure the precursors to utilisation (Goodhue & Thompson, 1995) in a unique way which had not been used before.

Dimension 4. Culture of the higher education institution as it relates to technology enhanced learning

Rovai related lecturer support to a sense of 'connectedness' and 'learning' within the work organisation (2002). The purpose of measuring organisational culture as it relates to lecturer support, was to identify if lecturers felt that a sense of 'connectedness' and 'community' was evident within their work organisation. Respondents would be asked how they felt about their organisational support systems through a series of questions which would take into account the support available from colleagues, and the available support from the organisation. Responses were to be presented along a Likert scale, which ranged from strongly agree = 1, through to strongly disagree = 5, recording answers to statements which included 'I feel encouraged to ask questions', 'I feel confident that others will support me', and 'I feel reluctant to speak openly'.

Organisational culture, as previously discussed in Chapter 2 (p. 16-17) is perceived to have an influence on lecturers' engagement with TEL.

Dimension 5. Work motivation and learning styles

When change in any format is introduced, there is an expectation that adjustment will occur. Uncomfortable experiences are unavoidable, particularly if faced with uncertainty of role and or responsibility. Discomfort level however, may decrease as an adjustment to learning occurs. Dunn (1984) suggested that there are several influential factors in learning, these include environment, emotion, sociology, physiology and psychology. Schneckenberg & Wildt (2006) went further and suggested that if no motivation to change is demonstrated, then no action will occur. The integration of the latter bodies of literature is to be synthesised as empirical evidence of such relationships is scarce. The purpose of asking lecturers to explore their learning styles and work values factors, was to measure how these two areas correlate with a number of factors from other dimensions. The purpose being to establish possible relationships and whether, if in existence, they influenced the lecturers' engagement with TEL.

A modified version of the Hygiene and Motivator factors questionnaire (Herzberg, Mausner, & Snyderman, 1959, cited by Furnham et al., 1999, p. 1043) was being used to measure work motivation. To measure learning styles, the Felder and Soloman learning styles inventory (1993) was being used to capture individual differences of active-reflector; sensing-intuitive; visual-verbal; and sequential-global. Zywno and Waalen (2002) advocated these aspects of learning styles as being significant in IT education, hence its choice for this study.

All of these tools have reported acceptable reliability scores (Choi, Lee, & Kang, 2009; Furnham et al., 1999; Saeed et al., 2009) and are readily available for use. Table 4.2 presents the topic focus organised into five dimensions, highlighting where each dimension is addressed within the research questions.

Table 4.2: Dimension, question focus and research question addressed within the survey instrument

Dimension		Question focus	Source	Research question(s)
1	Demography and background information	Years of service; Computer skill; Computer exposure.	Blake, (2009); Gattiker and Hlavka, (1992); Gilbert, (2011); McGill and Hobbs, (2007); Pajo and Wallace, (2001); Saeed et al. 2009).	RQ1 RQ3
2	Preferred face to face teaching method	Teaching in Higher Education.	Kember, (1997).	RQ3
3	Perception of the virtual learning environment	Utilisation; Anticipated consequences of use; Attitudes towards using; Impact; Task-Technology Fit.	Barbeite and Weiss, (2004); Blake, (2009); Gattiker and Hlavka, (1992); Gilbert, (2011); Joo et al. (2000); McGill and Hobbs, (2007); Pajo and Wallace, (2001); Saeed et al. (2009).	RQ2 RQ3 RQ5
4	Culture of the HE institution	Lecturer support.	Pajo and Wallace, (2001); Rovai, (2002).	RQ4 RQ5
5	Work motivation and learning styles	Work values; Learning styles inventory.	Litzinger et al. (2007); Furnham et al. (1999); Saeed et al. (2009).	RQ6 RQ7

Within the five dimensions, 12 areas of focused interest (question focus) were identified as factors to be explored. In the demography and background information section those factors were number of years in service; computer skill; and computer engagement. The factor of teaching in HE was identified in the preferred face to face teaching method section. The factors included within the section, perception of the VLE, were: utilisation; anticipated consequences of use; attitudes towards using; impact; and task-technology fit. Lecturer support was identified within the culture of the HEI as it relates to TEL, and finally work values and learning style inventory were included in the section work motivation and learning style. Identified through previous research (Barbeite & Weiss, 2004; Blake, 2009; Furnham et al., 1999; Gattiker & Hlavka, 1992; Gilbert, 2011; Joo et al., 2000; Kember, 1997; Litzinger et al., 2007; McGill & Hobbs, 2007; Pajo & Wallace, 2001; Rovai, 2002; Saeed et al., 2009), all of these factors are associated to, or have relationships with, engagement with TEL, they have not however, been integrated into one conceptual model.

Dependent Variable: Engagement with Technology Enhanced Learning

Given the significant growth in online learning, it was considered important to identify the factors that might explain lecturers' engagement with both the development and facilitation of online learning. It was also important to establish whether or not the factors that engage lecturers in online learning and teaching, are different from those that engage lecturers in other types of learning and teaching.

The dependent variable was engagement with TEL. Engagement for the purposes of the study was defined as participating in the development of online learning and teaching materials and/or the facilitation of online learning and teaching. TEL was defined as the enhancement of existing and new learning and teaching (HEFCE, 2009), through the utilisation of one or more technologies.

Stage 4: The fourth stage was the survey instrument construction. As the survey was to be delivered via the internet, the design was constructed online using HTML (Hyper Text Markup Language) on the university iSurvey web server; iSurvey is a local generation and research tool for distributing online questionnaires (www.iSurvey@soton.ac.uk). Each of the five sections were presented on a new page with clear instructions for completion. Each page

included a ‘Save and Continue’ button to allow the respondent the option of completing the survey in one visit or returning to the same point on re-accessing at a later time. The survey concluded with a submit button at the end of the questions. Triggers were built into the survey to highlight any missed questions; the respondent would automatically be re-directed to those questions missed, the option of submitting was nevertheless available without completing any specific question, if that was their original intention. Data collected, on completion of the questionnaire, would be generated into Microsoft® Excel spread sheets in readiness for analysis.

The quantitative nature of the study required that the data be collected in a format which allowed analysis through Microsoft® Windows Statistical Package for Social Sciences (SPSS) software. Many of the questions were formatted to gather values based on nominal/ordinal variables, these were quantified using Likert scales; a five point format was utilised, which included, where needed, space for open-ended responses. Respondents were also given space to add any further detail or responses including their name and contact detail for further involvement in the study if requested, or to request the result of their individual learning style.

Stage 5: In order to maximise data collection in the main study, a new data collection tool was devised and designed for the pilot study. Part of the development process, as seen in objective one, was to pilot the survey instrument to establish the clarity of questions, reliability and content validity. The data collection instrument utilised for the pilot study can be viewed in Appendix D.

4.3: Pilot Study

In survey research, the goal is to have objective and generalisable results. This goal is achieved by using, as far as is possible, an objective or un-biased data collection tool. In order to measure for objectivity and bias, the survey instrument was piloted on a sample of members of the target population. A pilot study can be described as a mini-version of a full-scale study or a trial run done in preparation for the main study. Piloting was initiated by contacting one senior member of the academic staff at a Faculty of Nursing where previously conducted qualitative research had been conducted to understand the impact of new

technologies on teaching and teachers. Once interest was gained, an invitation was extended to present the study under investigation. An offer was made to visit the university selected, and present the proposed research study to senior academics, one of whom was a co-author of the previous qualitative study published by Heaton-Shrestha et al. (2005).

Following the visit, approval for the commencement of the pilot study was received on 1st February, 2013. The pilot study targeted all 92 lecturers employed within the Faculty of Nursing and Midwifery. The Head of Department, in compliance with the Data Protection Act (Great Britain, 1998), forwarded a personally endorsed email to all staff which included an invitation to participate in the research from the researcher. Endorsement by senior personnel is often seen as valuable when conducting survey research (Totten et al., 1999). Testing would also confirm the reliability of the internet link, the appearance of HTML coding, and the compatibility of the tool with different browsers, all of which had been tested by the researcher, but could not be assured once received by respondents.

4.3.1: Survey instrument content validity and reliability

Since the data collection tool was in essence a new questionnaire, both the contents and construct validity, and its reliability, had to be demonstrated. In addition a post-survey questionnaire was designed to identify whether respondents understood the questions and instructions, as well as confirm that questions meant the same for all respondents. Potential problems such as poor response rates can also be highlighted within a pilot study.

4.3.1.1: Validity

Validity refers to how well a data collection instrument, in this study a survey instrument, measures what it sets out to measure. Whilst there are different types of validity; construct, criterion and content, not all will be relevant to survey research (Black, 1999). Construct validity generally refers to the measurement tool's continued ability over time to produce consistent results, for example a measurement tool such as the LSI consistently provides the same results with different groups of participants in different environments (Felder et al., 2005). Construct validity in the context of this survey instrument, could be more successfully measured over continued use; the survey however, is only intended

to be used to measure variables at one moment in time. Criterion validity can be subdivided into concurrent or predictive validity (Twycross & Shields, 2004); concurrent validity can be used to compare the ratings from this new survey instrument, to those of established tools utilised within previous research studies where engagement with technology enhanced learning had been measured. As this is a newly developed survey instrument, concurrent validity cannot be determined. Predictive validity can be used to predict a particular outcome at a future event, in the context of this study, the main survey results may be used as a measure for predicting the potential of a new employee to engage with TEL. Content validity pertains to the degree to which the instrument fully assesses or measures the construct of interest, for example, lecturers' engagement with TEL within HEIs. The development of a content valid instrument, for distribution in the main study, was achieved by an analysis of the responses provided on the data collection tool by the pilot study participants, as they were considered to be familiar with the construct of interest (external validity). Additionally, the post-survey questionnaire, which can be viewed in Appendix E, collected quantitative and qualitative data to measure the internal validity of the questions within the survey instrument.

4.3.1.2: Reliability

Reliability, is a statistical measure of reproducibility (Litwin, 1995), it refers to consistency and/or repeatability of the measurement. Consistency can be measured by using one or more of the strategies identified in Table 4.3, on the next page. Consistency can relate to the questionnaire being clear and well defined in order, therefore not confusing the respondents, repeatability means the findings from one survey group should be the same when repeated with a different group (Moule & Goodman, 2009).

Internal consistency is the term applied to groups of items that are thought to measure different aspects of the same concept. Cronbach's coefficient alpha measures internal consistency reliability among a group of items combined to form a single scale (Kent, 2001), and measures the reliability of the questions within the survey instrument. It is a reflection of how well the different items complement each other in their measurement of different aspects of the same

variable, and is suitable for attitude questionnaires, using scales such as rating and Likert (Black, 1999).

Table 4.3: Types of Reliability adapted from Trochim (2006)

Strategy	Usage
Inter-Rater or Inter-Observer Reliability	Generally applied in observational research and therefore not employed in this study.
Test-Retest Reliability	Used to measure stability – does the measure obtain the same measurements when used on the same person at different times? Given that technology and engagement are dynamic the probability of incurring confounders is high. The intention was to collect data at one point in time to measure engagement with TEL at this moment only. This test was not employed in this study.
Parallel-Forms Reliability	Generally performed on the same day; two sets of questions are given to respondents to test the same concepts. Usually applied to achievement tests and therefore this form of reliability was not employed in this study.
Internal Consistency Reliability	Internal consistency is important on any instrument and may be the only measure possible for a single administration of an instrument. Therefore this measure was employed in the study.

4.3.2: Ethical and Regulatory Approval

Prior to distribution of the survey instrument the research proposal was submitted for ethical approval to the University of Portsmouth's Science Faculty Ethics Committee. To meet the requirement of the committee a research ethics checklist was completed, and whilst Check and Schutt (2012) identify that survey research designs pose fewer ethical dilemmas than do other quantitative research methods, the study should be conducted in an ethical manner that accords with best research practice (Kelley et al., 2003). When conducting research involving human subjects, all respondents have the right not be harmed, the right to full disclosure, the right to self-determination, and the right to privacy, anonymity and confidentiality as detailed within the Declaration of Helskinki (World Medical Association, 2008). Conducting an online survey must also acknowledge the added dimension of using the internet (Buchanan & Hvizdak, 2009).

4.3.2.1: Voluntary participation and informed consent

Participation in the study was entirely voluntary; initiated by responding to an email invitation forwarded by the Head of the host organisation. To ensure respondents made an informed decision regarding their contribution to the study, they were given adequate information about the study in which they had volunteered to participate (Appendix F). Informed consent was based upon the ethical principle of autonomy; a person's right to make choices freely. Consent to participate was reiterated prior to commencing the online survey and recorded as agreement when started. The survey design was strengthened by allowing respondents to end participation at any point. Save and continue buttons were built into the instrument, giving respondents the option of skipping questions if considered not answerable (for any reason), or the option to quit and return at any point, or the option to completely opt out of the study without redress. Respondents were also given contact details to which to send any questions or concerns relating to the study (Nosek, Banaji, & Greenwald, 2002).

4.3.2.2: Data storage and anonymity

In keeping with the principles of the Data Protection Act (Great Britain, 1998) an attempt to maintain optimum protection of the respondents' identity was made. Specific detail relating to security and storage on third-party sites, and data encryption to safeguard anonymity, are of particular concern with online surveys. Therefore upon receipt of consent to participate, names were transferred to an Excel spreadsheet which was password protected and only accessible to the researcher; the University of Southampton iSurvey generation and research tool (https://www.isurvey.soton.ac.uk) randomly anonymised the names of respondents from the Excel spreadsheet with the subsequent generation of a unique code. The randomisation of the respondents by the iSurvey tool (from the Excel spreadsheet) was not accessible to the researcher. There was no means to cross-reference the names on the Excel spreadsheet to the unique ID assigned by the iSurvey tool.

Questionnaire returns were database protected through the University of Southampton's iSurvey system which uses encryption in the form of a Secure Sockets Layer (SSL). This ensures that data sent by participants cannot be intercepted by third parties. Data is stored on site, and therefore third party

hosting companies do not have access to any data. Survey questionnaires are kept for 10 years after receipt or subsequent publication, and then destroyed in keeping with the University of Southampton Research Data Management Policy (University of Southampton, 2011/12).

4.3.2.3: Confidentiality

The British Education Research Association (BERA) (2011) stress the importance of the researcher's responsibilities to all respondents, whereby an ethic of respect, which includes how the completed research will be used and to whom it will be reported, is given. Reassurance was stated in the information sheet in relation to publications and conference presentations, where protection of participants and HEIs taking part in the study would be withheld (Appendix F).

4.3.2.4: Ethical approval

Ethical approval was granted in January 2013 by the University of Portsmouth's Science Faculty Ethics Committee to conduct the pilot study (Appendix G).

4.3.3: Pilot study conduct

On receipt of expressions of interest, email addresses were transferred to an Excel spread sheet which was then saved as an Excel comma separated values (cvs) file on a personal password protected computer. When the Excel cvs file was uploaded into iSurvey, the system anonymised respondents with a numerical value; each person, who directly expressed interest in taking part in the study, was sent an information sheet relating to the research study (through iSurvey), the information sheet contained a unique link to the electronic survey, where respondents confirmed their consent to taking part in the study (Appendix H).

On completion of the survey instrument questionnaire, participants were automatically directed to the post-survey questionnaire which was composed of two sections. In Section One, participants were asked to rate five questions on five-point Likert scales, and give qualitative reasons for each of their answers.

<u>Section One questions</u>:

1. How easy was it to understand the questions asked?
2. How much did you enjoy completing the survey?

3. How would you grade the quality of the survey?
4. How engaging was the style of the questions posed?
5. How much did the language used help your understanding of the questions?

The first section concluded by asking participants what three things they liked and disliked about the questionnaire, and additionally what they felt could be improved.

The second section was used as a comparative tool to evaluate reliability of the results against those from the first section; participants were asked to indicate a score ranging from 1 = strongly disagree through to 5 = strongly agree, for each of the following statements:

Section Two questions:

a. The questions were easy to follow
b. I did not find the structure of the questions easy to follow
c. I enjoyed completing the questionnaire
d. I felt able to answer the questions posed
e. I felt there was some ambiguity in the language used
f. The questions made me actively engage in completing the survey
g. The style used for the questions was engaging
h. The amount of questions for each section was appropriate
i. I found the instructions for completion confusing
j. The depth of questioning was appropriate
k. Some of the questions were hard to answer
l. The length of time required to complete the survey was appropriate
m. The content of the questions was difficult to understand
n. I would not like to complete a survey like this again
o. I would be very interested to see the results of the survey analysis.

4.3.4: Post pilot analysis procedures

To test possible flaws in procedures, the responses to the pilot survey instrument were uploaded into the statistical package SPSS version 20. To review the content validity, questions within the post-survey questionnaire were analysed by employing descriptive statistics. Secomb and Smith (2011) argue that the opportunity to test theoretical frameworks, recruitment strategies, operational procedures, instructions and instruments on a sample from the target population will enhance the final outcomes of a planned larger study. The participants, 75% of whom had been employed as academics in higher education for over 15 years, were considered to be familiar with the construct of interest, thus confirming external validity.

A total of 16 online questionnaires were attempted, all were deemed useable, although four had random omissions. As the primary purpose of the pilot study was to measure the effectiveness of the survey instrument rather than coming to any conclusions about the data itself, missing data was treated by the insertion of substituted values. Returned questionnaires were observed to check for omission of data, which if random, as was the case, can generally be attributed to accident, rather than certain questions being skipped deliberately; thus eradicating the need to remove potential questions which may have indicated inappropriateness or misunderstanding.

4.3.5: Results

4.3.5.1: Participants

Of 92 lecturers, 35 expressed interest in taking part in the study; all were presumed to be engaged in TEL. Sixteen questionnaires were returned, with 12 fully completed. The post-survey questionnaire also saw 16 questionnaires returned, although only five were completed in full.

4.3.5.2: Pilot survey analysis

The quantitative raw data from the piloted survey instrument were exported from an Excel cvs file generated by iSurvey and entered into SPSS. Data was tabulated and cross-checked against an Excel spreadsheet of manually exported raw data to ensure accuracy of all variables and affirm researcher confidence in

the observed data. Cronbach's alpha was calculated to assess the internal consistency of the scaled data. The value of Cronbach's alpha (0.84 overall) determined the internal consistency of the participants' responses as higher than the 0.7 minimum acceptable co-efficient suggested by Pallant (2013). The set of reliability scores from the original research (where reported), along with scores for each dimension and their related scale areas from this pilot study, are shown in Table 4.4 below, with the number of items included within each subscale.

Table 4.4. Scales of the questions used and their associated reliability

Dimension/Section	Sub-scales	Items	Reliability	Pilot test reliability
Demography & Background information	Computer skill	8	0.79	0.68
	Computer exposure	12	*	0.81
Participants' perception of VLEs	Anticipated consequences of use	4	0.76	0.72
	Utilisation	6	0.95	0.96
	Impact	12	Not reported	0.66
	Task-technology fit	9	0.89	0.74
Culture of the HE institution	Lecturer support	14	0.90	0.77
Work motivation & learning style	Work values	18	0.73	0.94
	Learning styles inventory	44	0.66	0.84

* Exposure to computers/technologies in the original study included Blackboard, blogs, instant messaging, podcasts, vodcasts, wikis and email, these technologies were considered incomparable to the web technologies included in this study.

4.3.5.3: Post survey questionnaire data

Any omission of data, including failure to capture qualitative responses, recorded an incomplete data set against 11 participants. Qualitative responses however were randomly commented on by all participants.

Q1. How easy was it to understand the questions asked?

Forty percent (*n*=6) of participants reported, in Section One, that the questions were easy to understand, with annotation being clear. A further six said they were neither difficult nor easy to understand, with only three participants stating that the questions were difficult to understand. One participant specifically commented on the Learning Styles Inventory (LSI) questions, stating that it was unclear as to whether they had to consider their experience as a lecturer or their experience as a learner. One other participant said they also had concerns in relation to answering the questions in the LSI section as they could have ticked both answers. Two Likert scale questions in the Work Motivation and Values section were highlighted as having stem and root (scale) mismatches:

Questions: '*I would like to know your opinion as to whether your current role provides you with job security'*.

'I would like to know your opinion as to whether your current role provides you with opportunity for personal growth'.

Response options given: Rated from 1 = not important, through to 5 = extremely important

The participant qualitatively stated:

> *'I am unclear as to how you attribute importance to these questions as the response terminology does not match what you are asking'.*

Other comments recorded by participants included:

> *'Most of the questions were well constructed',*
>
> *'A few questions were ambiguous'* and
>
> *'I had to think a bit about them (*the questions*) and then make a decision'.*

In Section Two, participants were asked to provide a score to indicate whether the questions were easy to answer; 12 stated agreement, whereas four disagreed, conversely when asked to comment if some of the questions were hard to answer, nine agreed that some were hard, whilst a further four expressed strong

agreement that some were hard. Out of a total of 16 participants it would appear that the findings from these two areas, within Section Two, were conflicting; these findings were nevertheless supported by the qualitative data received, and the findings, as reported, from Section One.

Q2. How much did you enjoy completing the survey?

Half of the participants (*n*=8) enjoyed completing the survey, with responses confirming:

> *'It didn't take too long to complete'* and
>
> *'It was relatively easy to provide answers'*.

Conversely, one participant stated that the list of questions at the end (the LSI) was quite lengthy. One other participant asked for a clear rationale as to why this set of questions (the LSI) was relevant to the study. The scores returned for the related question in Section Two affirmed enjoyment in completing the questionnaire with a returned 75% (*n*=12) agreement.

Q3. How would you grade the quality of the survey?

All 16 participants graded the quality of the survey as good, with positive feedback being received in relation to how the survey was laid out. The majority of comments received related to quality and were all focused on the LSI – specifically:

> *'I was unclear as to what some of the questions were seeking to elicit'.*
>
> *'It was not always clear if the response was related to my experience of delivering or receiving education e.g. my learning style does not always reflect my teaching style. I like to provide variety within a module to meet the needs of a range of learning styles'.*
>
> *'A few of the questions were difficult to answer in that I could have said yes to both answers'.*
>
> *'I had no strong opinion'.*

One further comment stated that they were surprised that the questionnaire contained questions concerning personality. This is interesting as all questions specifically pertaining to personality were removed following ethical scrutiny.

Q4. How engaging was the style of the questions posed?

Seventy-five percent (*n*=12) of participants reported that the style of the questions posed was engaging as it made them think about what they do, also, it was quite swift to complete. There were concerns raised in relation to the LSI:

> *'I am unclear as to what aspect you are trying to investigate with this question'.*
>
> *'I found the material on learning styles a little confusing as I adapt my style to the task as I adapt my delivery to the topic'.*

Similar responses were recorded in Section Two to ascertain if the style used for the questions was engaging.

Q5. How much did the language used help your understanding of the questions?

All participants felt that the language used very much helped their understanding of the questions posed. Specifically, some of the additional information proved to be helpful, enabling participants to focus on the angle being considered, and what was being asked. However there was some reported ambiguity raised for one question in the LSI section; one person was not so sure about the use of concepts/theories, suggesting that *they* might have chosen different words. The question relating to web technologies used to support online teaching, raised one comment which drew attention to some newer technologies that this participant had never heard of.

Likes and dislikes of the survey instrument:

Balanced responses were received in relation to the things liked most about the survey and the things least liked, for example comments relating to the LSI inventory: some participants liked completing it as it made them think, whereas others did not, stating it was difficult to make a choice between two answers.

Similarity of the questions asked in the LSI are purposive to establish validity of the answers when determining the participant's individual learning style, this would therefore clarify the comment:

> *'I thought there was a similarity in some questions and was unsure if this was intentional'.*

Other positive comments noted the fact that the survey was online, the relatively short length of time needed to complete the survey, and the appropriate depth of questioning.

Of encouragement, was that the majority of participants would be very interested to see the results of the survey analysis and would be willing, in the future, to complete a similar survey to this. The majority (*n*=15) were able to answer the questions posed, and felt that the amount of questions for each section was appropriate.

The questions attracting most attention were those relating to the LSI. This tool has repeated consistency of validity (Felder et al., 2005), confirming the recommendation from Check & Schutt (2012) which is to utilise instruments that have sound reliability and validity; a comprehensive literature review provides the source of this at the onset of the research study. The purpose of using the LSI for the study was subsequently emphasised in the participant information sheet and on the lead into the question in the main study survey instrument.

Other items revised to improve face and content validity included the correction of the stem and root question mismatch. The LSI questions in the main study were amended to include additional information to determine that the question is asking for the lecturer's learning style, not the lecturer's teaching style. This is an important amendment as one of the research questions posed is to determine if the lecturers' learning style influences their engagement with TEL.

4.4: Summary

The development of a content valid instrument for distribution in the main study was achieved by amending questions and providing further instruction following an analysis of the responses provided in the post-survey questionnaire by the

pilot study participants. The completion of the post-test questionnaire confirmed the reliability of the internet link from the research survey; a similar link from the main survey questionnaire, to a random lottery draw for two monetary rewards, was to be used in the main study.

The testing of the survey instrument gave the researcher confidence in the methods used; this would ultimately improve data outcomes in the main study (Lancaster, Dodd, & Williamson, 2004). Despite one reminder the response rate remained relatively small (n=16; or 17%). Previous research suggests that response rates are often lower with electronic surveys (Buchanan & Hvizdak, 2009) with Panacek (2008) suggesting that good response rates are inversely proportional to survey length. It is therefore possible that the questionnaire could possibly have been seen as too long, or, as reported in feedback to the LSI questions, too complex to complete. For whatever reason, poor response rates can result in nonresponse bias (Alderman & Salem, 2010), although conversely, those who do respond are those that are most likely to be interested in TEL. It could, therefore, be postulated that the sample, albeit small, does provide accurate and representative data from the target population who are currently active in TEL. Totten et al. (1999) suggest some simple steps to increase the response rate in survey research; these include offering an incentive, building in targeted reminders, and if necessary asking participants for their contact details, which would allow the researcher an alternative option for data collection should responses be considered low and therefore not generalizable.

Participants in the main study were to be offered a financial incentive to stimulate participation. The main study survey instrument subsequently had a built-in triggered reminder built into it, and included an option for the participant to leave their contact details if they were willing to be contacted at a later date. Missing data can create problems of bias or affect the representativeness of results; if necessary this would be addressed in the main study by removing data sets with multiple sections omitted.

The next chapter presents the main study, the electronic distribution of the survey instrument and the subsequent data analysis.

Chapter 5 - MAIN STUDY

This chapter focuses on the main study which involved the electronic distribution of the survey instrument in the United Kingdom, and the subsequent data analysis.

5.1: Survey Distribution and Access

This survey targeted a population of academics employed within 74 universities, providing programmes of study to nurses, midwives and health professionals allied to health. Universities were identified from a number of sources including the National Health Service (NHS) careers website, the Universities and Colleges Admissions Service (UCAS) website, and the University Subject Tables (The Complete University Guide, 2014). The total number of academics employed was estimated at approximately 6,000 across identified health related programmes of study. The information was derived from academic staff contact details published on each of the universities websites. A precise number could not be established due to some universities not publishing employee data on their web sites. Contact and distribution took place over an eight month period between March and October 2014.

Gaining access to respondents proved challenging, particularly since compliance with the University of Portsmouth's ethical approval, did not permit direct access to academic staff. Instead, to recruit respondents, an introductory email, which included details of the researcher and the study under investigation, was sent to the most senior member of academic staff identified (usually Dean or Head) from each university's website (Appendix I). Where specific details could not be found, a review of the Council of Deans of Health website was made to confirm the name of either the Dean or Head of each of the UK university faculties for nursing, midwifery and the health professions. Each correspondence was aimed at building a relationship with influential 'gatekeepers'. This process began by personalising the email with the Dean or Head's professional title and surname, and including an introduction to the researcher, along with the purpose of the research, why it was important, and that ethical approval had been gained. The access email, sent to individually named personnel; the gatekeepers, asked for their support in distributing an email invitation, to their academic staff,

encouraging them to take part in the study (Appendix J). The standard email (included with the correspondence to the named gatekeepers) for distribution to all academic staff, included a detailed information sheet (Appendix K) relating to the purpose and process of the research study, as well as an endorsement of approval by the named gatekeeper. The process of gaining access to potential research participants is aptly described as uncontrollable, unpredictable and ill-defined by Wanat (2008). Authority to grant co-operation and access was protracted by ongoing communications and follow-up, which were mainly due to requests for proof of ethical approval, additional ethical approval submitted to individual host university's ethical committee, requests for my Curriculum Vitae (CV) and supervisor endorsement.

Table 5.1: Requests received prior to distribution of the staff invitation being agreed

Detail requested	Number of requests
University of Portsmouth submitted research protocol, ethics application and ethical approval letter.	**11**
University of Portsmouth ethical approval letter.	**7**
Completion and submission of the requesting university's ethical application forms for submission to the host university's ethical committee.	**3**
- Additional telephone conversations to discuss the submitted ethical approval letter and the intention of the research study.	2
- Additional request to forward my curriculum vitae to supplement the ethical approval letter.	1
- Research supervisor verification requested and reviewed in addition to the ethical approval letter.	1

As can be seen in Table 5.1 above, twenty-one universities required additional information. These included further information relating to additional ethical approval, included submitting the full research proposal, applying for local university ethical approval (in some instances this required a further ethical submission using the host's own documentation and formatting), as well as other

information requesting two telephone conversations with gatekeepers to discuss ethical approval and the overall aim of the research being undertaken. Both of these telephone conversations led to positive outcomes.

Some gatekeepers required additional reassurance as to how identification of participants could be protected in any subsequent publications, whilst others requested a full report on completion of the study; these were all noted for future actions/correspondence.

When gatekeepers passed the request to other personnel within their organisation, a shifting of involvement occurred which often resulted in a lack of control. Following up on requests in these situations, with no one person taking responsibility, frequently proved fruitless, either from paperwork being mislaid or misdirected. An example of a communication breakdown occurred when an administrator conveyed the granting of ethical approval via email; no information was given in the email as to who would distribute the staff invitation. A polite email was sent requesting this information, but no response was returned.

The British Educational Research Association (2011) state within their guidelines that researchers must recognise concerns, especially within survey research, which relate to the 'bureaucratic burden' of their research and actively minimise the impact of their research on the normal working and workload of other people who may become involved. Polonsky and Waller (2011) affirm the right to respect by stating that researchers should not cause hindrance or offense when asking for voluntary participation.

There are only so many times that communications can be effective, ultimately creating a nuisance is not conducive to good working relationships and so, in many instances, following discussions with my supervisors a judgement call was made to stop further communication.

Of the 74 universities contacted, 56 agreed to distribute the staff invitation. Table 5.2 highlights the final results of contact established with these 74 universities with 48 universities yielding positive responses. Fifteen universities failed to respond; all were contacted twice via email, leaving a four-week time period between first and second correspondence. For accuracy of contact details, a final check was made on the relevant university website. Subsequent emails were

sent to other named personnel, i.e. Heads of departments, elicited from their university website, but these too were unsuccessful in attracting responses. Three universities responded, but declined to participate. A personal request to take part in the study was received via LinkedIn™, from one academic employed in one 'non-responding university', this contact increased the responses from the number of universities taking part to 49.

Table 5.2: Overview of responses from universities

	University initial response	**Universities returning surveys**
Staff invitation distributed after initial contact made	37	33
Staff invitation distributed after second contact made	19	15
No response to invitation/ personal request received to take part via LinkedIn	15	1
Declined to participate	3	
TOTAL	**74**	**49**

A total of 313 academics across 49 UK universities responded to the initial invitation. On receipt of the academics' email response (where willingness to participate was expressed) each respondent's name, and contact email address were copied into an Excel csv file. At regular intervals, contact details from the Excel csv file were uploaded into the iSurvey tool to generate distribution of the survey instrument. iSurvey generated a unique code which was automatically assigned to each email address, enabling the questionnaire to be distributed automatically with anonymity protected. The first wave of responses were received in March 2014.

Both distribution of all correspondence described above and the distribution of the survey link was ongoing over an eight-month period of time. If, following distribution of the survey link, a completed questionnaire had not been received within a four-week time scale, an automatic reminder was generated by the iSurvey tool, and sent to each academic respondent. When all contact with relevant higher education establishments had been exhausted, and all of the

respondents had been contacted under the terms of the ethical approval granted, the survey was closed in October 2014.

From the 313 initial expressions of interest received, 232 respondents attempted to complete the questionnaire. One person overtly opted out of completing the questionnaire by submitting the 'opt out' feature built into the iSurvey tool. Following data cleansing and the completion of adding missing value treatments for minor omissions, the resulting data sets totalled 227, giving a response rate of 73%. Data sets were then exported from iSurvey into the statistical package SPSS for Windows version 21. Additional categorical data relating to 'University'; as in the pilot study all respondents were from one HEI, and 'Profession'; as in the pilot study all respondents were lecturers with a nursing background, were coded numerically in order to facilitate complete data analysis (Appendix L). The purpose of asking for the identification of each HEI was to look at the association between lecturers' engagement with TEL and the university's academic standing. New university developments, according to Bond and Goodchild (2013) have technology integrated into them, with state of the art teaching equipment, and a philosophy of delivering a plethora of online courses, which may, therefore, reflect the organisational culture. The purpose of identifying the respondent's profession, for example, a 'nurse' lecturer or 'radiographer' lecturer, was to determine whether any one profession was utilising TEL more than another within their learning and teaching.

Learning style inventory data were exported into a discrete SPSS file to determine each participant's individual learning style. Following this initial analysis the coded outcome was reinstated to complete each participant's data set.

It was noted that ten participants had requested feedback on their individual learning style, although one person did not include contact details, which due to anonymity of the questionnaire, could not be subsequently followed up.

5.2: Statistical Procedures

The starting point for statistical procedures focused on the type of level of measurement employed, i.e. nominal, ordinal or interval/ratio levels of measurement for the identified variables within each of the sections of the survey instrument. Determining the correct level of measurement is essential for accurate analysis, with clear differences being attributed to Likert scale data versus Likert type data (Robertson, 2012).

Literature suggests that Likert scale data are analysed as interval scales, with findings being presented using means, standard deviations and parametric tests, these methods however are inconsistent with the nature of Likert-type data according to Boone and Boone (2012). If there is no 'measure' between the intervals, then the general rule is to apply non-parametric testing. Non-parametric tests are used when the data represents, as in this study, Likert-type data presented using nominal and ordinal level scales (Field & Hole, 2003).

Table 5.3, on the next page, provides an overview of the level of measurement (ordinal or nominal) used in the survey alongside what was considered to be the most appropriate tests for applying both descriptive statistical analysis, and inferential statistical analysis for non-parametric data.

Table 5.3: Overview of the statistical tests employed

Question	Scale	Descriptive statistics	Inferential statistics
1.1	Nominal	Frequency	Measure of variance
1.2	Nominal	Frequency Central Tendency: Mode	
2.1	Ordinal	Frequency Central Tendency: Mode, SD and Mean[2]	Chi square test Rank order correlation Measure of variance
3.1	Ordinal	Frequency Central Tendency: Mode	Chi square test Rank order correlation
3.2; 3.3	Ordinal	Central Tendency: Mode	Chi square test Rank order correlation
4.1	Ordinal	Frequency	Chi square test Rank order correlation
5.1; 5.2; 5.3; 5.5	Ordinal	Central Tendency: Mode only 5.1. 5.2 and 5.5	Chi square test Rank order correlation
5.4	Nominal	Frequency Percentages	Chi square test Rank order correlation
5.6		Frequency Percentages	
6.1; 7.1	Ordinal	Frequency	Chi square test
7.2	Yes/No	Frequency Percentages	Chi square test Rank order correlation

Descriptive statistical analysis included frequency reporting, central tendency reporting of mode, and percentages; these are presented under the relevant section headings from the survey instrument. Inferential statistical analysis for non-parametric data are reported in relation to the research questions posed. Tests used were as follows:

1. Pearson chi square, used to determine if a relationship existed between categorical variables, and Cramer's *v* applied as an extension to the chi square test to determine how significant and important the relationship was. Cramer's *v* , can be used when tables have more than 2 x 2 rows and columns,

[2] Descriptive statistics used to characterise data analysed by parametric tests include the mean. Generally non-parametric tests used to characterise data analysed by non-parametric tests only include the mode, median and percentile rank.

2. Spearman rank order correlation coefficient was applied to identify the correlations between the dependent variable and the independent variables, and

3. Kruskal-Wallis was used for measures of variance between the dependent variable and unrelated groups within the independent variables.

5.2.1 Descriptive statistics

Descriptive statistics have been used to describe the main features from the research study by displaying frequencies, percentages and mode scores from the data. Graphical representation depicts the general trends in the data (Field, 2009) using descriptive statistics techniques to highlight observations by frequency distribution/histograms.

Section One: Introduction

The first introductory section of the survey instrument recorded the lecturers' employing organisation and their professional role.

Q1.1: Where are you employed?

The distribution of lecturers' responding across the 49 participating HEIs is shown in Figure 5.1 on the next page (range 1 – 23; mean 5). The majority, 82% (*n*=40), were received from English universities, followed by Scotland with 12% (*n*=6), Wales with 4% (*n*=2) and with the least, Northern Ireland (2%, *n*=1). In eight universities only one person responded, the best performing university yielded 23 responses, but in total only 6 universities yielded above ten responses.

UK responses		*n*	%
	England	40	82
	Scotland	6	12
	Wales	2	4
	N. Ireland	1	2

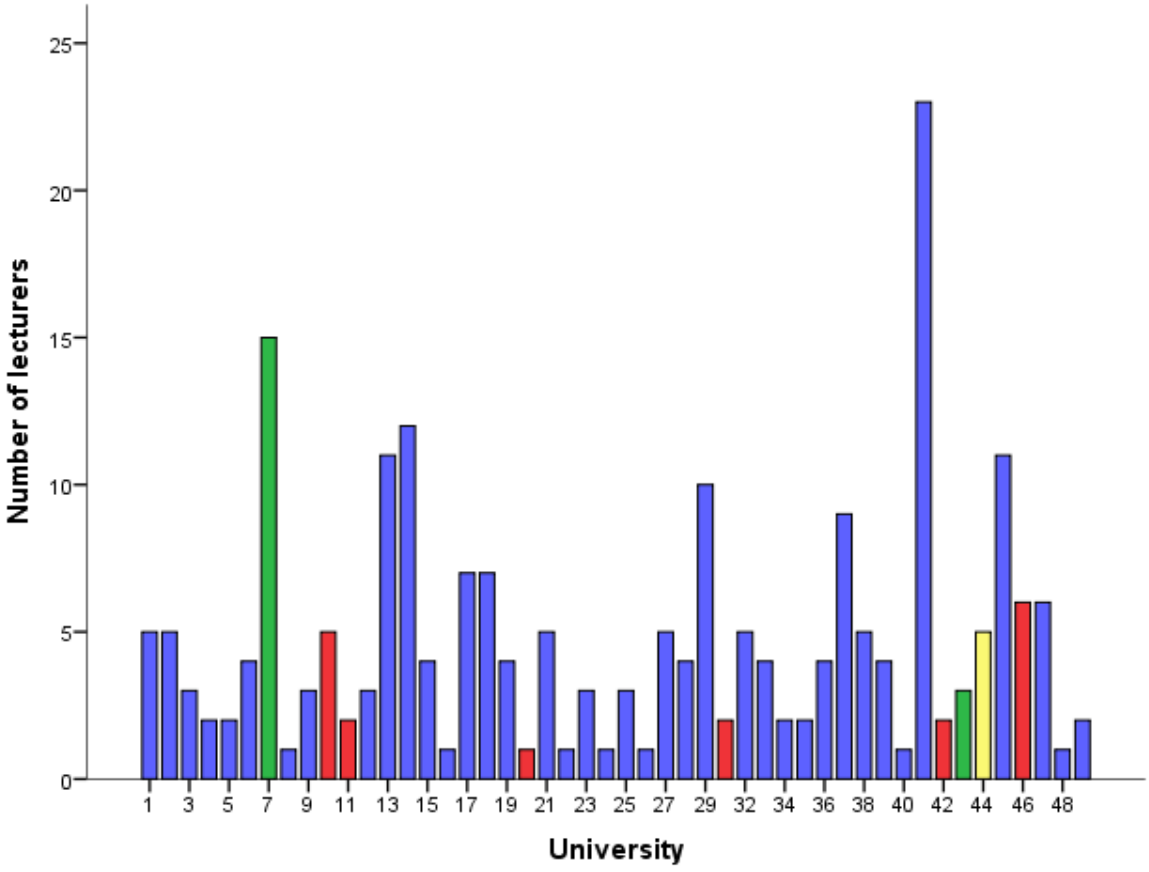


Figure 5.1: Distribution of lecturers' responding from the 49 UK Higher Education Institutions taking part in the study

Q1.2: What is your current professional role?

Table 5.4 shows the frequency score calculated for each lecturer's professional status, as well as total numbers represented for each of the professions (*N*= 227; range 1 – 127).

The majority of respondents, 59%, (*n*=127) were nurses, the next highest group of 39 (15%) identified their professional status as 'other', recording qualitative data such as senior lecturer, lecturer, researcher; this was not the intention of the

question. A number of professions, not included in the drop-down list, were nevertheless recorded qualitatively within 'other', and included biomedical scientist (*n*=1), dietician (*n*=1), homeopath (*n*=1), lymphoedema practitioner (*n*=1), operating department practitioners (*n*=4), and psychologist (*n*=1).

The lowest number of professions represented are those of biomedical scientist, counsellor, dietician, forensic scientist, health visitor, lymphoedema practitioner, nutritionists, psychologist, speech and language therapist, and sports scientist; collectively representing ten participants.

Table 5.4: Professional status of participants

Professional Status	***n***	**%**
Counsellor	1	-
Forensic scientist	1	-
Health scientist	4	2
Health visitor	2	1
Midwife	8	4
Nurse	127	59
Nutritionist	1	-
Occupational therapist	15	7
Pharmacist	4	2
Physiotherapist	8	4
Radiographer	7	3
Radiotherapist	2	1
Social worker	3	1
Sociologist	3	1
Speech and Language therapist	1	-
Sport scientist	1	-
Other	39	15
Total	**227**	**100**

The choices given for professional status, on the survey instrument, were elicited from each university's websites' list of courses/programmes and modules delivered, so for example, if nursing programmes were delivered, nursing was included on the drop-down list. The drop-down list was presumed to be comprehensive.

The measure of central tendency 'Mode' was used to evaluate the single item variable of professional role, as recommended by Field (2009) because of its

helpfulness to describe the frequencies and percentages of this category, particularly as the measures of mean, median and normal distribution, due to the nature of this question, would not be meaningful.

Section Two: Engagement with Technology Enhanced Learning

Q2.1: In considering your role with technology enhanced learning would you say that you are:

- Fully engaged, requiring no support
- Fully engaged, but requiring minimal support
- Engaged, but requiring extensive support
- Engaged, but not actively contributing
- Part of a module team, but not engaged with TEL

Engagement was defined by the researcher as "participating in the development of online learning and teaching materials and/or the facilitation of online learning and teaching". TEL was defined as the "enhancement of existing and new learning and teaching (HEFCE, 2009), through the utilisation of one or more technologies". A total of 227 answered this question, ranging from seven lecturers being part of a module team, but having no engagement with TEL, to the majority, 51% (*n*=115) being fully engaged with TEL, with only minimal support required. Table 5.5 reports the responses which range from 7 – 115; *N*=227.

Table 5.5: Lecturers' engagement with technology enhanced learning

Lecturers' Engagement With Technology Enhanced Learning	***n***	**%**
Fully engaged, requiring no support	18	8
Fully engaged, requiring minimal support	115	51
Engaged, but requiring extensive support	65	28
Engaged, but not actively contributing	22	10
Part of a module team, but not engaged with TEL	7	3
Total	**227**	**100**

The professional status of the 18 participants (8%) reporting full engagement with TEL, were represented by nurses (*n*=10), 'others' (*n*=4), health scientists (*n*=1),

operating department practitioners (*n*=1), physiotherapists (*n*=1), and psychologists (*n*=1). The professional status of those not engaged with TEL (3%, *n*=7) were represented by nurses (*n*=2), biomedical scientists (*n*=1), health scientists (*n*=1), midwives (*n*=1), occupational therapists (*n*=1), and physiotherapists (*n*=1). No single profession emerges as being more, or less, engaged with TEL than any other.

The dependent variable, 'lecturers' engagement with TEL', was examined for normal distribution; the median and mode both reported as '2', which represented full engagement with TEL with minimal support. The mean response to lecturers' engagement with TEL was slightly higher at 2.49 (*SE*=.059); indicating that the majority were either fully engaged with TEL with minimal support, or engaged but requiring extensive support. Figure 5.2 illustrates the slight positive skew of *SD*=.89. Most common inferential statistics assume that the scores i.e. from the dependent variable, are normally distributed (Maltby, Day, & Williams, 2007). For a normal distribution, skewness values would be close to zero, but they can range between -1 and +1 (Mertler and Vannatta, 2005). Standard deviation measures take into account each and every score in a normal distribution from the midpoint of 0; values reported below were within the acceptable range of normality.

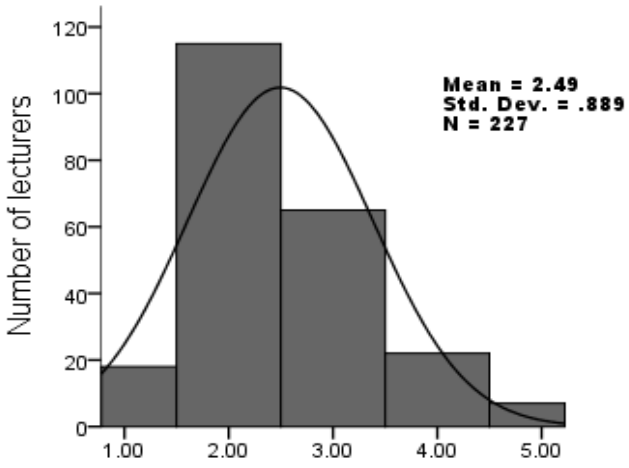


Figure 5.2: Lecturers' engagement with technology enhanced learning showing distribution with a slight positive skew

The reported response indicated that the majority of participants (79%, *n*=180) were engaged with technology enhanced learning, but all required varying levels

of support in order to do this. The reported results of normal distribution, albeit with a slight positive skew, suggested that the general population of lecturers delivering health science education were engaging with technology enhanced learning with minimal levels of support. Conversely, given the number of participants taking part in this research, it could be argued that lecturers who are interested in the topic area, and utilise technology, are more likely to respond (Barrios, Villarroya, Borrego, & Olle, 2011; Shelton, 2013); the findings therefore are not generalisable.

Section Three: Demography and Background Information

Q3.1: How many years of experience do you have in higher education teaching and learning?

A percentage score was calculated for each ranking within the 'years of service' subscale ranging from those with less than 2 years' service within higher education to those with over 15 years of service in higher education as shown in Table 5.6.

Table 5.6: Lecturers' length of service within Higher Education

Years of Service in Higher Education	*n*	%
Less than 2	23	10
2 - 5	33	15
6 – 9	38	17
10 – 14	57	25
Over 15	76	33
Total	**227**	**100**

The majority of lecturers have been employed in higher education for over 15 years (*n*=76; 33%). When considering the period of training for professional registration, and achievement of minimal higher education qualification for entry into higher education academia, these figures reflect the greater numbers employed within age groups above 40 years of age (71,345; (56%)) (Higher Education Statistics Agency, 2015).

Q3.2: Would you say that working with computers …

Lecturers were asked to identify their views on working with computers as can be seen in Table 5.7.

Table 5.7: Lecturers' views relating to working with computers

Would you say that working with computers	1	2	3	4	5	*N*
Is very difficult	126	76	23	2	0	227
Is very complicated	100	90	25	10	1	226
Requires technical ability	22	49	57	80	19	226
Creates psychological stress	45	73	53	49	7	227
Can only be done if one has been trained	30	80	64	45	8	227
Is only advisable for people with lots of patience	75	93	39	17	3	227
Makes a person more productive at their job	10	29	53	78	57	227
Is for young people only	201	18	1	1	6	227

Key: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

The majority of lecturers strongly disagreed/disagreed, that working with computers was difficult (89%, *n*=202), complicated (84%, *n*=190) and for young people only (96%, *n*=219). Sixty percent (*n*=135), strongly agreed/agreed that working with computers made them more productive in their job. Although 44% (*n*=99), strongly agreed/agreed that working with computers requires technical ability.

Q3.3: Web technologies used to support online teaching include …

Lecturers were asked to identify the web technologies they used to support their online teaching against 11 items shown in Table 5.8, where 1 equals never used to 5 equalling always used. The 11 items included two-way sharing technologies such as, wikis, blogs, and Skype, and one-way technologies such as podcasts, video and photographs.

Table 5.8: Web technologies used by lecturers to support their online learning and teaching

	1	2	3	4	5	*N*
Discussion Forums	31	44	47	65	39	**226**
Blog	110	36	49	19	12	**226**
Wiki	104	48	43	17	14	**226**
Podcast	84	45	48	38	12	**227**
Lecture capture	93	40	42	38	14	**227**
Adobe connect	164	29	16	13	4	**226**
Photographs	36	21	25	67	78	**227**
Really Simple Syndication (RSS)	169	28	19	6	4	**226**
Twitter	147	29	18	19	13	**226**
Skype	99	37	35	32	24	**227**
Video	17	20	30	72	88	**227**

Key: 1= Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently, 5 = Always.

One-way information sharing technologies reported as being used always, included videos 39% (*n*=88), and photographs 35% (*n*=78), with collaborative two-way sharing technologies, as shown in Table 5.8 for discussion forums, being used frequently by 29% (*n*=65).

Collaborative web technologies which encourage the sharing of information, communication, ideas and group work, and yet were reported as never used, included blogs 49% (*n*=110) and wikis 46% (*n*=104); Adobe Connect 72% (*n*=164) and Skype 44% (*n*=99).

Technologies which enable recorded information to be saved for sharing, repeated use or revision, in the form of podcasts or lecture capture, were never respectively used by 37% (*n*=84) and 41% (*n*=93) of lecturers. Whilst the functionality of ‘tagging’ using RSS feeds was also never used by 75% (*n*=169) of lecturers, with Twitter never used by 65% (*n*=147) of lecturers.

These results indicate that there was significant use of technologies that require minimal upkeep and maintenance on the part of the lecturer, whereas emerging technologies that have the potential to engage learners in a more dynamic way,

but require a more proactive relationship on the part of the lecturer, were not so readily utilised.

Section Four: Preferred Face to Face Teaching Method

Q4.1: I want to know which is your preferred approach to teaching …

Lecturers were asked to rank their preference of face to face teaching methods, along a scale ranging from one to indicate strong preference, through to five their least preferred method. Table 5.9 displays the strongest preferences as group discussion (30%, *n*=67) and enquiry based learning (30%, *n*=66). The least preferred method of face to face teaching was identified as the lecture (54%, *n*=117).

Table 5.9: Ranked preference of lecturers' face to face teaching methods

Rank	Lecture	Problem based	Group discussion	Problem solving	Enquiry based
1	22	16	67	49	66
2	11	42	49	73	44
3	29	47	58	48	37
4	37	81	34	35	31
5	117	31	12	13	39
Total	**216**	**217**	**220**	**218**	**217**

Key: 1= Strong preference; 5 = Least preference

The two most preferred methods represent teaching approaches which involve learners being active participants in the teaching and learning process, rather than being a passive participant. These approaches reflect the pedagogy associated with the learning environment of healthcare, in that communication is integral to collaborative working relationships (Vermunt & Endedijk, 2011). This question received a low response rate which may have been attributed to the change from rating scales to a ranking system. One participant raised a query stating that each teaching method could not be rated along a range of 1-5.

Section Five: Participants' Perception of Virtual Learning Environments

Lecturers were asked to answer questions presented within five subscales:

- Anticipated consequences of use
- Utilisation
- Impact
- Attitudes towards using
- Task technology fit

Q5.1: **Anticipated consequences of use**: I want to know if you would say that …

- 'Working with computers would make me feel very nervous'.
  Eighty-four percent (*n*=191) of lecturers reported strong disagreement;

- 'I get a sinking feeling when I think of trying to use a computer'.
  Eighty-nine percent (*n*=201) of lecturers reported strong disagreement;

- 'Computers make me feel uncomfortable'.
  Eighty-eight percent (*n*=199) of lecturers reported strong disagreement, and;

- 'Computers make me feel uneasy and confused'.
  Eighty-five percent (*n*=192) of lecturers reported strong disagreement.

Noting that the technological advancements over the last decade have transformed teaching and learning, Jump (2011) confirms that digital technology, in the form of computers, are the essential artefacts university lecturers' use in their day to day teaching practices. Essentially the results indicated a positive acceptance relating to the lecturers' use of computers.

Q5.2: **Utilisation**: I want to know if you feel confident …

The six items within this subscale all reported the lecturers' total confidence in their ability to starting an internet search engine, 93% (*n*=210); connecting to the internet homepage, 90% (*n*=204); downloading and saving files, 93% (*n*=210);

providing hyperlinks into emails, 80% (*n*=182); finding previous pages by using the ‘back’ button, 93% (*n*=212); and using internet search engines, 93% (*n*=212).

The findings represented positive results relating to the lecturers’ confidence in performing essential tasks relating to computer operations.

Q5.3: **Impact**: I want to know, from your experience as a teacher/researcher, what factors might impact on any (further) development or your (or any potential) engagement with online learning over the coming years.

As shown in Table 5.10 on the next page, 36% (*n*=82) of lecturers strongly agreed that the time it takes to learn how to use new technologies would impact on their development of any future online learning. There was also agreement that technical problems (including unreliable networks) (27%, *n*=61), and the lack of support staff (23%, *n*=53) would also make an impact.

Thirty percent (*n*=69) disagreed that too few standards and guidelines would make an impact of any future online learning development, with 26% (*n*=60) disagreeing that the lack of staff development would make any impact.

The majority expressed strong disagreement to ‘don’t want to change’ (67%, *n*=152), ‘doesn’t enhance student learning’ (52%, *n*=117), ‘lack of enthusiasm’ (48%, *n*=108), ‘lack of confidence’ (42%, *n*=95), as well as ‘lack of incentives’ (39%, *n*=87), in relation to their engagement with future development of online learning.

Table 5.10: Items impacting on the lecturers' future engagement with technology enhanced learning

Item	1	2	3	4	5	*N*
Time to learn new technologies	8	21	47	69	82	**227**
Lack of confidence	95	56	40	24	12	**227**
Lack of incentives	87	66	39	20	14	**226**
Lack of enthusiasm	108	58	31	19	11	**227**
Don't want to change	152	46	21	6	2	**227**
Doesn't enhance student learning	117	58	25	20	7	**227**
Lack of staff development	34	60	51	56	26	**227**
Lack of support staff	28	50	51	53	45	**227**
Organisation structure	30	55	61	49	32	**227**
Technical problems/ unreliable network	34	60	46	61	26	**227**
Too many standards/guidelines	41	61	71	36	18	**227**
Too few standards/guidelines	67	69	67	19	5	**227**

Key: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

These results were particularly encouraging as they implied that lecturers are ready to embrace technology enhanced learning in the future. The main area of concern, which has been continually reported in the literature, and yet remains unaddressed, is the element of time that lecturers need in order to learn how to use new technologies (Blin & Munro, 2008; Browne et al., 2008; Ottenbreit-Leftwich, Glazewski, Newby, & Ertmer, 2010; Reed, 2014).

Q5.4: **Attitudes towards using**: I want to know which statement summarises your view of using VLEs.

The five statements have been frequently associated to Rogers' adopter categories of innovativeness (Rogers, 2003); innovators, early adopters, early majority, late majority and laggards.

The majority (40%, *n*=90) defined themselves as early adopters, in other words they liked new technologies and used them before most other people that they know. The range of responses (11 – 90) reporting the frequency, and percentage for each item, are shown in Table 5.11.

Table 5.11: Attitude expressed by lecturers relating to their use of web technologies

Summary of feelings	Adopter Category	*n*	%
I am sceptical of new web technologies and use them only when I have to	1 Laggard	12	5
I am usually one of the last people I know to use new web technologies	2 Late Majority	11	5
I usually use new web technologies when most people I know do	3 Early Majority	78	34
I like new web technologies and use them before most people I know	4 Early Adopter	90	40
I love new technologies and am among the first to experiment and use them	5 Innovator	36	16

The responses, as shown in Figure 5.3, represent normal distribution with the mean reporting 3.56, the median reporting 4, and *SD*=.99. On inspection however, a negative skew is reported, albeit below the criterion of +1 or -1 (Maltby et al., 2007), suggesting that lecturers providing health science education are predominantly within the "early majority and early adopter" categories, rather than category "early majority and late majority", as reported in Rogers (2003) diffusion of innovation theory.

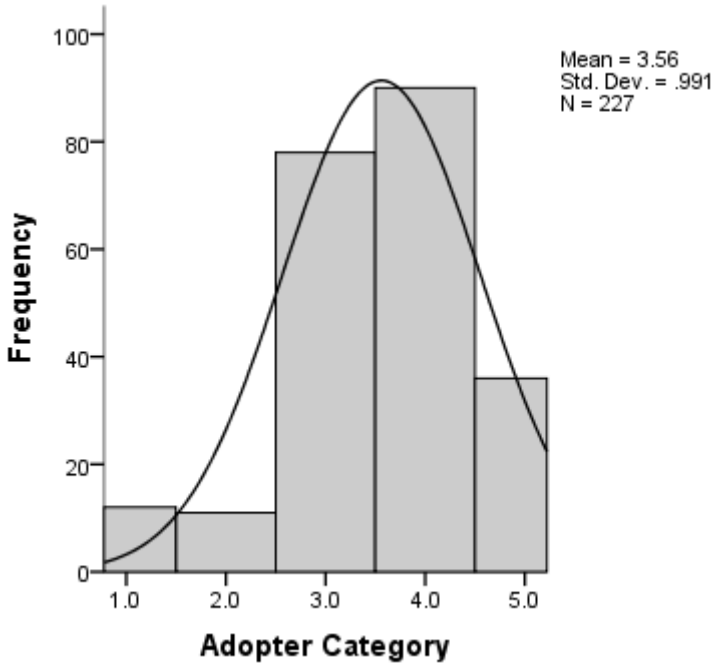


Figure 5.3: Normal distribution, with a slight negative skew, across Rogers' (2003) diffusion of innovation categories

Empirical evidence would suggest that these findings are comparable to lecturers working within other HEIs (Heaton-Shrestha et al., 2005; Yuen et al., 2011).

Q5.5: **Task-Technology Fit**: I want to know in what way a virtual learning environment supports your module delivery.

Universities support the use of virtual learning environments which essentially provide lecturers with a computer management system for a number of uses including, repositories of information for students, asynchronous discussion forums, wikis and blogs (McGill & Hobbs, 2007). Shah and Cunningham (2009) suggest that the range of activities has increased, although predominantly they continue to be used to convey module/course information.

As shown in Table 5.12, the majority of lecturers agreed that the VLE supported their online module delivery.

Table 5.12: Identification of how the virtual learning environment supports online delivery

Task-Technology Fit			
The VLE	***n***	**%**	**Mode**
Fits well with the way I work	75	33	4
Is compatible with my work	70	31	4
Is easy to use	85	37	4
Is user friendly	72	32	4
It is easy to become more skilful	87	38	4
Output is easy for students to understand	81	36	4
Materials can be easily updated	89	39	4
Does what I want it to do	68	30	3
New features are easy to learn	85	37	3

Key: 3 = Neutral; 4 = Agree.

To clarify the VLE used, participants were also asked to identify which VLE they used within their employing organisation. Table 5.13, on the next page, displays the most frequently used VLE as being Blackboard (61%, *n*=139), with Web CT being used the least (1%, *n*=2).

Table 5.13: Virtual Learning Environment used for online delivery

VLE used	*n*	%
Blackboard	139	61
Moodle	65	29
Computer Management System i.e. Sharepoint	5	2
WordPress	4	2
Web CT	2	1
Other	12	5
Total	**227**	**100**

Twelve lecturers (5%) reported 'other', stating they used StudyNet (*n*=4), PebblePad (*n*=2), an in-house VLE similar to Blackboard (*n*=1), and Learntech (*n*=1). Three lecturers did not know which VLE they used, whilst one said 'I have a tablet delivery project/trying to get away from using Blackboard'.

Section Six: Culture of the Higher Education Institution as it relates to technology enhanced learning

Q6.1: As a lecturer in health care sciences would you say that you feel ….

Table 5.14 on the next page, shows the extent to which lecturers felt supported within their HEI and was measured across two subscales: "Connectedness" and "Online learning". Items within the two subscales were explored to gain a collective sense of community within the lecturers' employing organisation. Lecturers reported their personal perceptions relating to feelings of belonging, shared values and beliefs, and expectations of working within their respective organisations.

There was a sense of connectedness amongst the lecturers' taking part in this study, with 68% (*n*=151) agreeing that colleagues cared about each other, and 50% (*n*=113) reporting that they were confident of receiving support from others. Fifty-two percent (*n*=119) felt belonging by disagreeing that that their faculty

lacked a spirt of belonging. Although 40% (*n*=90) did not feel isolated when developing online materials, 32% (*n*=72) reported that they did.

A sense of sharing values and beliefs was also evident in relation to the lecturers' expectations of online learning, specifically 63% (*n*=142) of lecturers felt encouraged to ask questions, whilst 68% (*n*=155) felt they could openly ask questions relating to online learning.

Table 5.14: Sense of community: Connectedness and Online

	1	**2**	**3**	**4**	**5**	***N***
Connectedness:						
Colleagues care about each other	8	25	43	88	63	**227**
Connected to others	22	61	64	64	15	**226**
Lacking in a spirit of belonging (R)	50	69	61	33	13	**226**
Isolated whilst developing online materials (R)	39	51	64	61	11	**226**
You can rely on others to help	15	43	60	73	35	**226**
Other staff depend on me	10	32	68	76	40	**226**
Confident that others will support me	11	36	66	74	39	**226**
Online learning:						
I am encouraged to ask questions	7	33	45	92	50	**227**
It's hard to get help when you have a question (R)	46	78	59	35	8	**226**
Uneasy exposing gaps in my understanding (R)	73	96	32	20	5	**226**
Reluctance to speak openly (R)	91	64	44	18	9	**226**
Other colleagues do not help me to learn (R)	79	74	48	21	4	**226**
Ample opportunity is given to learn	22	53	78	52	21	**226**
My educational needs are not being met (R)	47	60	61	40	18	**226**

Key: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree
(R) = Reverse coded

Overall, the lecturers reported that the support provided within their organisation was positive. A number of lecturers however, neither agreed nor disagreed that ample opportunities were given to learn (35%, *n*=78), or that their educational needs were being met (27%, *n*=61).

The delivery of online learning and teaching presents unique challenges for lecturers, particularly when delivering content which requires alternative teaching methods. The experiences and emotions of delivering face to face teaching are managed throughout the delivery, and afterwards can be discussed in a fairly informal way with colleagues and peers. With online learning, management of the situation, content and delivery, is an isolated activity for a lecturer, which can be challenging. The reported results however, suggest that lecturers felt supported, which implies that there was a sense of community which they proactively managed themselves (Regan et al., 2012).

Section Seven: Work Motivation and Learning Styles

Work Motivation

Q7.1: In relation to your current work role I want to know the importance you place on ……

Table 5.15, on the next page, presents the work motivation subscale which set out to identify the factors lecturers rated in relation to importance. Subdivided into Hygiene Factors and Motivation Factors, the first area considered the hygiene needs of the lecturer by asking what importance they placed on the physical and psychological conditions within their own HEI. The second area, work motivator needs, explored the importance the lecturer placed on the fulfilment of satisfiers, for example, responsibility and interesting work, within their job role.

Within the work motivation and values section, the majority of lecturers placed “Extreme Importance” on half of all of these factors, and indicated that a further eight factors were “Very Important”. There was a slight leaning towards importance being fulfilled within the hygiene factors; these factors are ascribed to the context or environment where the job has to be done (Furnham et al., 1999).

Table 5.15: Work motivation factors identified by lecturers

Work motivation subscale	1	2	3	4	5	*N*
Hygiene Factors:						
Job security	0	5	15	86	120	**226**
A fair and considerate line manager	0	4	12	85	124	**225**
Flexible hours of work	3	6	35	79	103	**226**
Job status	7	32	86	69	32	**226**
Opportunity to interact with people	1	5	24	85	111	**226**
Benefits i.e., annual leave, sick leave	1	15	42	95	73	**226**
Pleasant co-workers	0	4	17	96	109	**226**
Pay	2	10	60	114	39	**225**
Work conditions	0	5	47	113	61	**226**
Motivation Factors:						
Opportunity for personal growth	1	4	11	75	135	**226**
Use of your ability (knowledge at work)	0	1	4	68	151	**224**
Recognition for doing a good job	4	2	23	104	92	**225**
Responsibility	1	12	49	107	57	**226**
Achievement at work	1	2	20	107	95	**225**
Influence in the work place	0	17	78	98	33	**226**
Interesting work	0	1	8	85	132	**226**
Advancement (chance for promotion)	13	23	63	79	48	**226**
Meaningful, important work	0	1	9	75	140	**225**

Key:
1 = Not important,
2 = slightly important,
3 = moderately important,
4 = very important,
5 = extremely important.

Learning Styles

Q7.2: This question related to the lecturers' preferred learning style by asking the question: I want to know what your LEARNING style is (not your teaching style).

Lecturers were asked to choose only one answer from the index of learning styles' questions. They were given an additional note to help clarify their thinking:

> *'If both responses seem to apply, think about the last time you were in a learning situation before responding'.*

The lecturers' preferences were recorded on four dimensions of the Felder and Soloman Index of Learning Styles (1993). The four dimensions include active-reflective, sensing-intuitive, visual-verbal, and sequential-global, which when analysed report responses to 44 questions. Analysis highlights either a strong or moderate preference for each element of the dimension, or a balanced outcome of the two elements within each dimension.

Empirical evidence generally supports the notion that there is a clear high value which determines an individual's learning style. Of interest therefore were the results shown in Table 5.16 which report 40% (*n*=90) of lecturers as having balanced learning styles across all four dimensions (range 90 – 128; *N*=224). High values across each of the discrete dimensions offer limited impact when contrasted with the numbers reported across the balanced styles.

Table 5.16: Lecturers' identified learning styles

	Strong	Moderate	**Balanced**	*N*
Active	18	48	128 (56%)	224
Reflective	3	27		
Sensing	22	40	90 (40%)	225
Intuitive	31	42		
Visual	39	67	92 (41%)	224
Verbal	5	21		
Sequential	12	32	118 (52%)	224
Global	17	45		

When considering the results, a balance between the two components which constitute the active/reflective (processing) dimension is reported as desirable (Felder & Soloman, 1993). To be effective as a problem solver a person needs to be able to function across both components of the sensing/intuitive dimension (perception). And whilst most people, according to Felder and Silverman (1998), are visual learners, a balance within the dimension of visual/verbal (input) demonstrates capability of processing information presented either visually or

verbally. In this study, 47% (*n*=106) of lecturers demonstrated either a strong or moderate preference for visual learning; this was the highest scoring discrete section after the balanced reporting of all four dimensions. Finally, a balance between sequential/global (understanding), demonstrates both linear and holistic thinking processes (Filippidis & Tsoukalas, 2009). Response rates for this question are noted as being low, this may have been attributed to it being the last one on the survey, and having the most constituent parts.

5.2.1.1: Descriptive statistics summary

Descriptive statistics were used to summarise, describe and explore data, where appropriate. Whilst the normal distribution, as illustrated in Figures 5.2 and 5.3 would not normally be associated with descriptive statistical analysis of non-parametric data, the measurement was undertaken for visual summarising of the findings, and for more descriptive analysis.

5.2.2: Inferential statistics

Inferential statistics determine whether the sample of research participants are representative of the scores that would have been obtained in the entire population when addressing the research questions (Gilchrist & Wright, 2009). Inferential statistics, using non-parametric tests for association, correlation and variance, have been applied, within this research, to make inferences from the sample data of 227 participants, to the entire population of lecturers in UK Higher Education health science sectors.

5.2.2.1: Tests for association

Pearson chi square testing was used to establish association, this test was then enhanced by measuring the strength of association (the effect size) using Cramer's *v* (Table 5.17). Both tests are recommended for use when there are more than five items (categories) within the research variables.

Chi square tests are performed on non-parametric data for statistical significance at the 0.05 level, particularly when data are in the form of frequency counts. They compare frequencies actually observed from the research, with expected frequencies, to see if they are significantly different. Cramer's *v* enables the

researcher to judge the significance of the results by highlighting the magnitude of difference (Kotrlik, Williams, & Jabor, 2011).

Table 5.17: Descriptors for reporting and interpreting Cramer's *v* effect size (Rea & Parker, 2014, p. 219)

Value	Association	Interpretation
.00	No relationship	
.00 - <.15	Very weak	Not generally acceptable
.15 - <.20	Weak	Minimally acceptable
.20 - <.25	Moderate	Acceptable
.25 - <.30	Moderately strong	Desirable
.30 - <.35	Strong	Very desirable
.35 - <.40	Very strong	Extremely desirable
.40 - <.50	Exceptionally strong	Either an exceptional good relationship or the two variables are measuring the same concept
.50 - <1.00	Redundant/ Perfect relationship	The two variable are probably measuring the same concept

Prior to conducting the chi square tests, a missing data analysis was conducted on all of the variables of interest. The majority of variables had less than 1% missing data. Because these rates were low, no imputations were performed for the descriptive chi square analysis. Each test of association has been addressed in relation to the research questions posed.

Q1: How does the level of engagement with TEL relate to the length of employment held by the lecturer, the beliefs held in relation to working with computers and the use of web technologies?

Level of engagement with TEL/Length of employment in Higher Education

Chi square tests were conducted to firstly examine whether there was an association between the length of service the lecturer had been employed within HE and the dependent outcome variable of lecturers' engagement with TEL. Taking into consideration when collaborative web technologies emerged, following the development of the world-wide-web in circa 1993, university students now aged 21 years (and below) will have been exposed to digital evolution; so named 'digital natives'. Conversely lecturers' length of employment within HEIs, ranging from those with less than two years' experience, to those

with over 15 years' experience, may have revealed an association to the evolvement of digital technologies.

The results reported no significant associations, at the 0.05 level, between the lecturers' length of service in HE and their level of engagement with TEL, X^2 (16, *N*=227) = 19.54, *p*=.242, although Cramer's *v*=.15 reported a minimally acceptable level of association. The results, as shown in Figure 5.4 reported that the largest proportion of lecturers (*n*=37) who had been employed in HE for over 15 years, were all fully engaged with TEL, with only minimal support required.

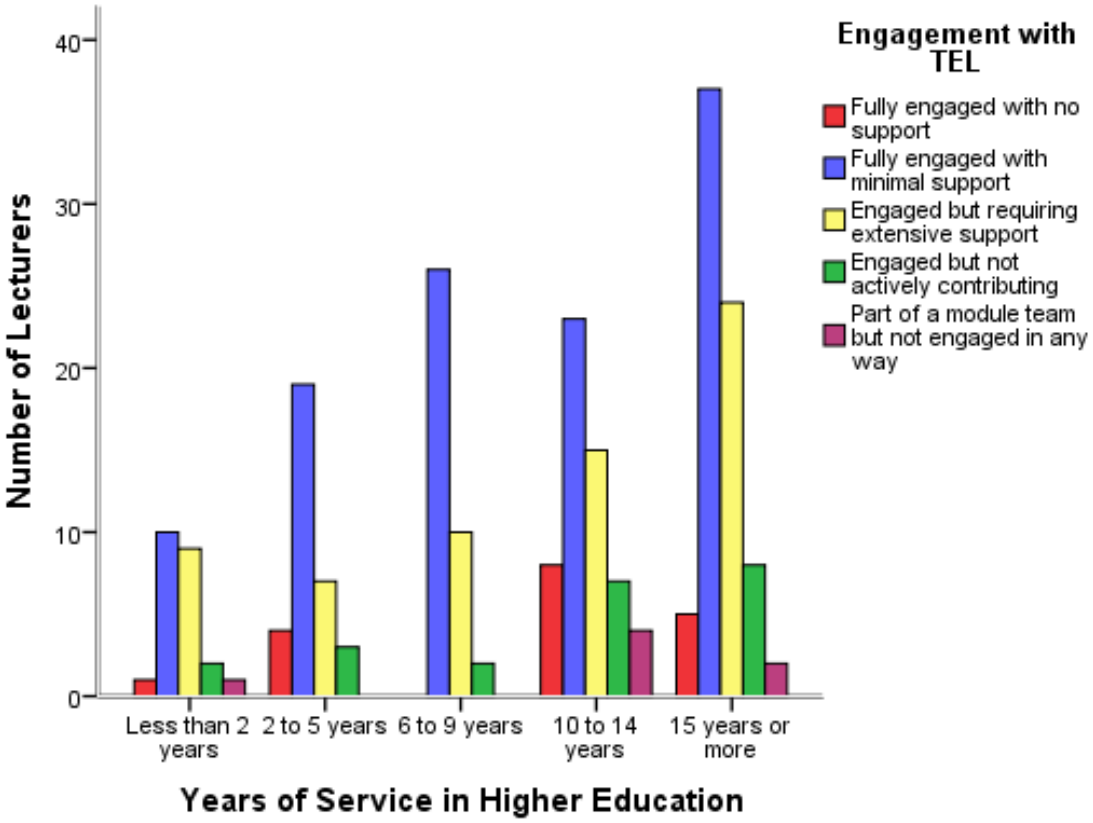


Figure 5.4: Association between the lecturers' engagement with technology enhanced learning and their years of service in Higher Education

Level of engagement with TEL/Working with computers

Chi square tests for association were analysed to establish if the lecturers' engagement with TEL was in any way related to beliefs or anxieties associated with working with computers, which as reported by Oye, Iahad, and Rahim (2012) have the tendency to evoke levels of uneasiness relating to the use of a computer. These negative emotional states can manifest as frustration and confusion, which in turn are reported to affect academics productivity and the usage of technology in teaching and learning (Teo, 2008).

Table 5.18, presented on the next page, highlights three significant associations between the lecturers' perceived beliefs of working with computers and their engagement with technology enhanced learning. The three associations are reported for working with computers 'is very difficult', 'creates psychological stress', and 'requires technical ability'.

The difficulty associated with working with computers was statistically significant (X^2 (12, *N*=227) = 26.79, *p*=.008) with Cramer's *v*=.20 reporting an acceptable strength of association to the lecturers' engagement with TEL. The psychological stress of working with computers also reported statistical significance in relation to the lecturers' level engagement with TEL (X^2 (16, *N*=227) = 28.16, *p*=.031), with Cramer's *v*=.17 giving a minimally acceptable strength of association. The technical ability associated with working with computers was reported as being statistically significant (*p*=.030), although Cramer's *v*=.14 reported a very weak association.

The items relating to the need for patience and training when working with computers, reported weak strength of association (Cramer's *v*=.16 and .17 respectively) to the lecturers' engagement with TEL, although the chi square test, as shown, reports relative statistical significance. Whilst working with computers was expressed as being very complicated, with a minimally acceptable strength of association reported (Cramer's *v*=.15), this was not statistically significant *(*X^2 (16, *N*=226) = 21.37, *p*=.165).

Table 5.18: Lecturers' views of working with computers in relation to their engagement with technology enhanced learning

	Pearson chi square	Cramer's *v*	Association
Working with computers			
is very difficult*	X^2 (12,*N*=227) = 26.79, *p*=.008	.20	Moderate
creates psychological stress*	X^2 (16,*N*=227) = 28.08, *p*=.031	.18	Weak
requires technical ability*	X^2 (16,*N*=227) = 28.16, *p*=.030	.14	Very weak
is very complicated*	X^2 (16,*N*=226) = 21.37, *p*=.165	.15	Weak
requires training*	X^2 (16,*N*=227) = 25.50, *p*=.061	.17	Weak
requires patience*	X^2 (16,*N*=227) = 22.04, *p*=.142	.16	Weak
increases productivity*	X^2 (16,*N*=227) = 11.83, *p*=.756	.11	Very weak
is for young people only*	X^2 (16,*N*=227) = 18.62, *p*=.289	.14	Very weak

* reported expected count less than 5.

All of the variables reported expected counts of less than 5. When this occurs Field (2009) suggests that the low count means the results cannot be trusted. However, as reported by Sue and Ritter (2012) if the *p* value is recorded as less than alpha, then the variables do have a statistically significant relationship. The value of alpha is associated to the level of confidence, for a 90% level of confidence (CL) the value of alpha = 0.10, for results with a 95% level of confidence the value of alpha is 0.05.

As shown, the chi square testing reported statistical significant associations relating to three items: working with computers 'is very difficult', 'creates psychological stress', and 'requires technical ability'. To determine exactly what that significance was, the row and column percentages needed to be examined in order to interpret the data patterns in more detail (Field, 2009). Association is noted as being significant where adjusted residual counts report a critical value above a 1.96 threshold for significance (Murtaugh, 2014). Visual inspection of the data revealed nine associations with values above 1.96.

Post hoc testing was subsequently performed on the nine associations, as shown in Tables 5.19, 5.20, and 5.21, to determine exactly which frequencies were statistically significant using the Bonferroni testing method which adjusts the *p* value to correct for Type 1 errors (Beasley & Schumacker, 1995; Garcia-Perez & Nunez-Anton, 2003).

The lecturers' engagement with TEL was analysed with an adjusted *p* value =.0025, in relation to the level of difficulty expressed, the creation of psychological stress, and the technical ability of working with computers. The adjusted *p* value is derived by dividing the number of frequencies (20 in this analysis) by the *p* value of 0.05. Murtaugh (2014) expresses caution with the rigidity of having a firm cut-off between significant and non-significant results, and the interpretation of the *p* values just above and just below the cut-off point.

Level of difficulty expressed:

Table 5.19: Bonferroni adjusted *p* values; technology enhanced learning/ working with computers is very difficult

	Disagree	Strongly disagree
1		2.0 (*n*=14); *p*=.0455
2		3.0 (*n*=75); *p*=.0027
3	3.8 (*n*=34); *p*=.0001	3.9 (*n*=25); *p*=.0001

Key:
1 = Fully engaged with no support,
2 = Fully engaged with minimal support,
3 = Engaged but requiring extensive support

Table 5.19 shows that 75 lecturers, out of a total of 115, strongly disagreed that working with computer was very difficult, these lecturers were all fully engaged with TEL (with minimal support); with an adjusted *p* value =.0027 this figure is marginally above the cut-off point, but arguably is significant. This shows that a third of all of the lecturers in this study, 33% (*n*=75), with minimal support are engaging with TEL and reporting that working with computers is easy.

Conversely, there was a significant association reporting 59 lecturers, out of a total of 65, who required extensive support, but were nevertheless engaged with

TEL, who in disagreement, have suggested that working with computers is easy. The difference may be attributed to the lecturers' ability to perform everyday tasks associated with working with computers in general, and the skills they associate with their level of engagement with TEL.

Creation of psychological stress:

Table 5.20: Bonferroni adjusted *p* values; technology enhanced learning/ working with computers creates psychological stress

	Agree	Strongly disagree
2		3.4 (*n*=33); *p*=.0007
3	3.2 (*n*=23); *p*=.0014	

Key:
2 = Fully engaged with minimal support,
3 = Engaged but requiring extensive support.

The post hoc testing performed on the association between lecturers who believed that working with computers created psychological stress, and their engagement with TEL, as shown in Table 5.20, were of interest.

The results confirmed opposing associations, indicating that those who were engaged with TEL but required extensive support (23 lecturers out of a total of 65 (36%)), are in agreement that working with computers does create psychological stress. Suggesting that if support was available the psychological stress associated with working with computers could be reduced. Conversely, lecturers who, with minimal support, were fully engaged with TEL (33 out of a total of 115 (29%)), strongly disagreed that working with computers created psychological stress. Suggesting that familiarity with technology reduces the complexities and anxiety associated with its use.

Technical ability:

Table 5.21, on the next page, shows that there were very small numbers of lecturers reporting strong agreement that working with computers requires technical ability. From this small number, 3 out of a total of 7, are not engaged with TEL, this suggests that those who are not engaged, consider specific technical skills would be necessary in order to do so.

Table 5.21: Bonferroni adjusted p values; technology enhanced learning/ working with computers requires technical ability

	Strongly agree
2	-3.7 (*n*=2); *p*=.0002
3	2.4 (*n*=10); *p*=.0164
5	3.3 (*n*=3); *p*=.0010

Key:
2 = Fully engaged with minimal support,
3 = Engaged but requiring extensive support,
5 = Part of a module team, not engaged in any way.

Level of engagement with TEL/Web technologies used

Technologies used within blended and online learning engage the learner through a simple concept referred to as scaffolding; in essence their learning journey is built on by utilising the constructivist philosophy. The learner engages with the online materials, and through collaboration and discussion with peers and/or lecturers, learning is measurable. From personal experience TEL can be misinterpreted as the addition of supplementary materials onto a VLE, as reported by Jump (2011).

Table 5.22, on the next page, presents the findings to indicate lecturers' level of engagement with TEL, which shows a statistically significant association in their use of three technologies: discussion forums (X^2 (16, *N*=227) = 34.22, *p*=.005), Cramer's *v*=.20; wikis (X^2 (16, *N*=226) = 38.02, *p*=.002), Cramer's *v*=.21; and videos (X^2 (16, *N*=227) = 44.39, *p*<.001) with Cramer's *v*=.16, of the total technologies presented (11), at the 0.05 level of significance.

As reported in Table 5.8 (p. 82), the three most frequently used technologies in online learning and teaching were videos (70%, *n*=160), photographs (64%, *n*=145), and discussion forums (46%, *n*=104). Wikis were reported as always being used by 31 lecturers (14%), suggesting low numbers of statistically significant associations to the levels of engagement with TEL.

Table 5.22: Lecturers' use of technologies in relationship to their engagement with technology enhanced learning

	Pearson chi square	Cramer's *v*	Association
Videos*	X^2 (16,*N*=227) = 44.39, *p*<.001	.22	Moderate
Wiki*	X^2 (16,*N*=226) = 38.02, *p*=.002	.21	Moderate
Discussion forum *	X^2 (16,*N*=227) = 34.22, *p*=.005	.20	Moderate
Blog*	X^2 (16,*N*=226 = 31.76, *p*=.011	.19	Weak
Skype*	X^2 (16,*N*=227) = 31.24, *p*=.013	.19	Weak
Podcast*	X^2 (16,*N*=227) = 28.78, *p*=.025	.18	Weak
Adobe Connect*	X^2 (16,*N*=226) = 28.51, *p*=.027	.18	Weak
RSS*	X^2 (16,*N*=226) = 22.33, *p*=.133	.16	Weak
Lecture Capture*	X^2 (16,*N*=227) = 17.68, *p*=.343	.14	Very weak
Photographs*	X^2 (16,*N*=227 = 17.18, *p*=.374	.14	Very weak
Twitter*	X^2 (16,*N*=226) = 14.06, *p*=.594	.13	Very weak

* reported expected count less than 5.

Further inspection of data identified the levels of lecturer engagement with TEL, and discrete associations to the *use of discussion forums* (Table 5.23), *use of wikis* (Table 5.24), and the *use of videos* (Table 5.25). An adjusted *p* value of *p*=.002 was applied as the Bonferroni corrected *p* value.

Discussion forums:

Table 5.23: Bonferroni adjusted *p* values; technology enhanced learning/ discussion forums

	Never	Sometimes
3	2.6 (*n*=15); *p*=.009	
4		2.4 (*n*=9); *p*=.016
5	2.3 (*n*=3); *p*=.021	

Key:
3 = Engaged but requiring extensive support,
4 = Engaged but not actively contributing,
5 = Part of a module team, but not engaged in any way.

Table 5.23 reports that none of the associations between TEL and the use of discussion forums, previously reported by chi square testing, were statistically significant when further analysed through post hoc testing using the Bonferroni corrected *p* value.

Wikis:

Of the very small number of lecturers (five) that required no support and were fully engaged with TEL, there was a reported significance (X^2 (2 ,*n*=5) = 3.1, *p*=.002) as seen in Table 5.24, in relation to the fact that they often use wikis when presenting learning and teaching materials in an online environment.

Table 5.24: Bonferroni adjusted *p* values; technology enhanced learning/ wikis

	Never	Often
1		3.1 (*n*=5); *p*=.002
3	2.2 (*n*=42); *p*=.028	

Key:
1 = Fully engaged with no support,
3 = Engaged but requiring extensive support.

Videos:

Table 5.25 below, reports no significant associations between the lecturers' engagement with TEL and the use of online videos (X^2 (2, *n*=10) = 2.3, *p*=.021); (X^2 (2, *n*=2) = 2.0, *p*=.046) when analysed using Bonferroni's adjusted *p* value.

Table 5.25: Bonferroni adjusted *p* values; technology enhanced learning/ videos

	Never
3	2.3 (*n*=10); *p*=.021
5	2.0 (*n*=2); *p*=.046

Key:
3 = Engaged but requiring extensive support,
5 = Part of a module team, not engaged in any way.

Q2: How does the lecturer perceive their computer use, their beliefs about VLE usage, and what impact does this have on their engagement with TEL?

Level of engagement with TEL/perception of computer use

There may well be a reluctance to engage with online teaching and learning that is inherent with the lecturers' experience of using computers in general. By exploring the lecturers' perceptions relating to computer usage it may be possible to identify if there is an association to their engagement with TEL. However, analysis through chi square testing reported no statistically significant relationships between the lecturers' engagement with TEL and their perceived use of computers as shown in Table 5.26 on the next page.

Table 5.26: Relationship between the lecturers' use of computers and their engagement with technology enhanced learning

	Pearson chi square	Cramer's *v*	Association
Computers make me feel uncomfortable	X^2 (16,*N*=226) = 24.97, *p*=.070	.17	Weak
Computers make me feel uneasy and confused	X^2 (16,*N*=227) = 13.79, *p*=.615	.12	Very weak
I get a sinking feeling when I think of trying to use a computer	X^2 (16,*N*=227) = 8.46, *p*=.934	.10	Very weak
Working with a computer would make me feel very nervous	X^2 (16,*N*=226) = 7.95, *p*=.950	.09	Very weak

Level of engagement with TEL/views relating to VLE usage

Ninety-five percent of universities in the UK, according to Brown (2010), have invested in a VLE offering a set of internet tools for use on their own computer systems. In general, the VLE is a closed web platform where lecturers provide resources to support their learning and teaching. That said, the tools provided through VLEs are varied, but as a minimum, allow asynchronous and synchronous discussion through discussion boards, email, blogs and wikis.

Table 5.12 (p. 88) previously reported lecturers' agreement with seven out of nine statements relating to how the VLE supported their online learning and teaching, these included: The VLE …

'Is easy to use;
Is user-friendly;
Output is easy for students to understand
Fits well with the way I work
Materials can be easily updated;
Is compatible with my work; and,
It is easy to become more skilful'.

Table 5.27 presents the findings reporting lecturers' level of engagement with TEL, and the five areas where statistically significant association was recorded; four out of these five areas, were noted above for their positive support of online learning and teaching:

'*Is easy to use;*
Is user friendly;
New features are easy to learn;
Output is easy for students to understand;
Fits well with the way I like to work'.

Table 5.27: Relationship between lecturers' views on VLE usage and engagement with technology enhanced learning

The VLE :	Pearson chi square	Cramer's *v*	Association
Is easy to use	(X^2 (16, *N*=227) = 48.38, *p*<.001)	.23	Moderate
Is user friendly	(X^2 (16, *N*=227) = 40.27, *p*=.001)	.21	Moderate
New features are easy to learn	(X^2 (16, *N* 227) = 35.24, *p*=.004)	.20	Moderate
Output is easy for students to understand	(X^2 (16, *N* 227) = 34.00, *p*=.005)	.19	Weak
Fits well with the way I work	(X^2 (16, *N*=227) = 32.07, *p*=.010)	.19	Weak
Does what I want it to do	(X^2 (16, *N*=226) = 24.05, *p*=.089)	.16	Weak
It is easy to become more skilful	(X^2 (16, *N*=227) = 23.09, *p*=.111)	.16	Weak
Materials can be easily updated	(X^2 (16, *N*=227) = 22.74, *p*=.121)	.16	Weak
Is compatible with my work	(X^2 (16, *N*=227) = 22.25, *p*=.135)	.16	Weak

A Bonferroni correction was applied to the five significant associations, reporting all effects at a .0025 level of significance.

Of the small number of lecturers (three out of seven) that were not engaged with TEL, there was reported significance in relation to their strong disagreement that the VLE was easy to use (X^2 (2, *n*=3) = 4.3, *p*<.0001), and that it was user-friendly (X^2 (2, *n*=3) = 4.1, *p*<.0001). Two lecturers, out of the seven not engaged with TEL, strongly disagreed that new features of the VLE were easy to learn (X^2 (2,

n=2) = 3.2, *p*=.0014). These results suggest that the lecturers' concerns relating to VLE use, could well be a reason why they do not engage with TEL.

Twenty lecturers, who disagreed that new features of the VLE were easy to learn, were engaged with TEL but in need of extensive support (X^2 (2, *n*=20) = 3.4, *p*=.0007), suggesting with support they would be able to learn the new features.

Twenty-six lecturers who were fully engaged with TEL (requiring minimal support) reported statistical significance in strong agreement that the VLE output was easy for students to understand (X^2 (2, *n*=26) = 3.7, *p*=.0002). This result suggests that these lecturers were confident working with TEL, materials they design may be produced with the students' learning needs taken into account.

There was no reported associations reported between the lecturers' engagement with TEL and their views relating to how well the VLE fitted with the way they worked.

Q3: What relationships exist between preference of face to face teaching method, engagement with TEL, web technologies a lecturer uses to support online teaching, and attitude towards using a VLE?

The face to face teaching style of the lecturer is said to have a direct relationship to the style of online teaching and learning adopted (Saeed, et al., 2009). The five teaching styles ranged from those with no interaction with learners i.e. the lecture, to those which rely on two-way interaction i.e. enquiry based learning. Similarly, the web technologies ranged from those which identified no interaction with the learner i.e. photographs and videos, to those which relied on two-way interaction i.e. Skype and wiki. It was therefore of interest to explore the association between the web technologies used, and the lecturers' preferred teaching style, as they related to the lecturers' level of engagement with technology enhanced learning.

Level of engagement with TEL/face to face teaching style

Firstly, as can be seen in Figure 5.5, enquiry based learning was the most preferred face to face teaching method (range 2 – 38), with the majority of lecturers, who expressed this preference, identifying that they were fully engaged with TEL (requiring minimal support). The lecture was the least preferred face to

face teaching method (range 1 – 9); with the majority of lecturers identifying that they were engaged with technology but required extensive support.

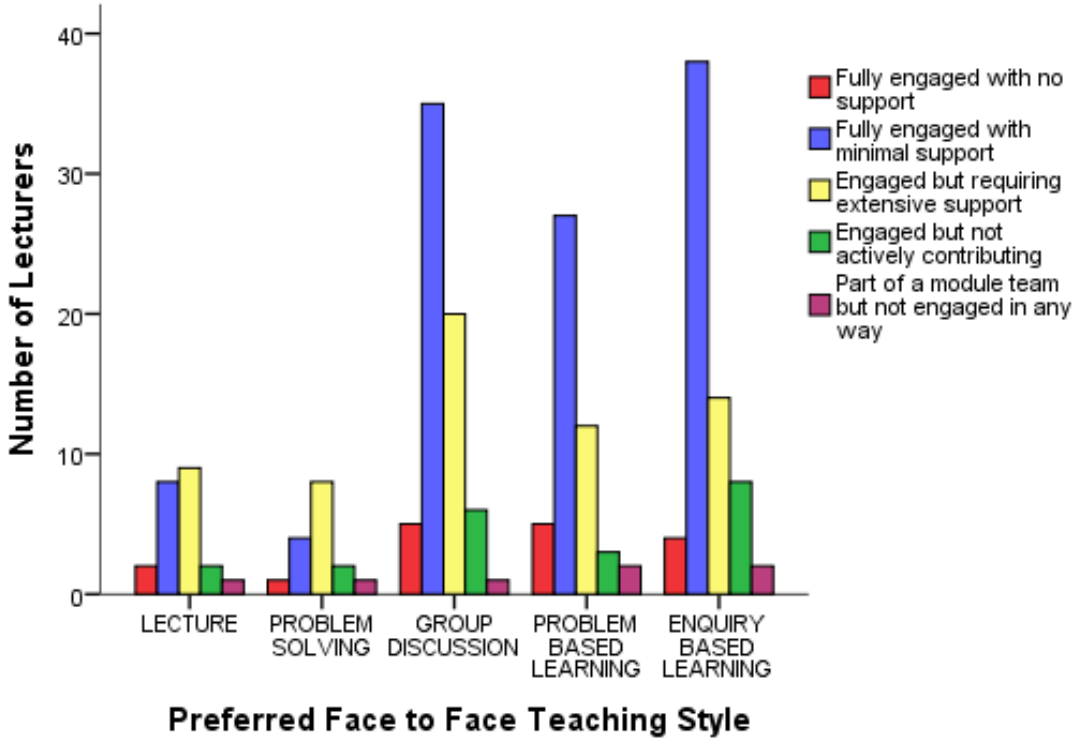


Figure 5.5: Lecturers' preferred face to face teaching style in relation to their engagement with technology enhanced learning

To examine the data for associations relating to the lecturers' preferred face to face teaching styles and their engagement with TEL, chi square analyses were conducted (Table 5.28). There were no statistically significant associations, although a minimal strength of association (effect size) for enquiry based learning and group discussion was reported by Cramer's *v*=.18 respectively.

A Bonferroni correction was applied, reporting all effects at a *p*.002 level of significance across EBL and group discussion: one area of significance was reported; 12 lecturers, out of 18 who were fully engaged with TEL (with no support), expressed a strong preference for enquiry based learning (X^2 (2, *n*=12) = 3.7, *p*<.001), no other strong associations were reported.

Table 5.28: Lecturers' preference of face to face teaching style and its association to technology enhanced learning

	Pearson chi square	Cramer's *v*	Association
EBL	X^2 (20,*N*=227) = 30.80, *p*=.058	.18	Weak
Group discussion	X^2 (20,*N*=227) = 29.55, *p*=.077	.18	Weak
Problem solving	X^2 (20,*N*=227) = 21.77, *p*=.353	.16	Weak
Lecture	X^2 (20,*N*=227) = 10.14, *p*=.966	.11	Very weak
PBL	X^2 (20,*N*=227) = 7.06, *p*=.996	.08	Very weak

Most preferred face to face teaching style /web technologies used

Secondly, the lecturers' most preferred face to face teaching style was examined for associations with the web technologies they used to support their online teaching and learning. Table 5.29, on the next page, reports that the use of Skype and photographs were both statistically significant; Skype (X^2 (20, *N*=227) = 35.98, *p*=.015) with Cramer's *v*=.20 reporting an acceptable strength of association; photographs (X^2 (20, *N*=227) = 33.90, *p*=.027), with Cramer's *v*=.19 reporting a minimal acceptable strength of association.

Table 5.29: Lecturers' most preferred face to face teaching style: enquiry based learning, and the web technologies lecturers use to support online learning and teaching

	Pearson chi square	Cramer's *v*	Association
Skype	X^2 (20,*N*=227) = 35.98, *p*=.015	.20	Moderate
Photographs	X^2 (20,*N*=227) = 33.90, *p*=.027	.19	Weak
Twitter	X^2 (20,*N*=226) = 35.98, *p*=.083	.18	Weak
Blog	X^2 (20,*N*=226) = 27.50, *p*=.122	.17	Weak
Wiki	X^2 (20,*N*=226) = 21.79, *p*=.352	.16	Weak
Discussion forum	X^2 (20,*N*=226) = 23.53, *p*=.263	.16	Weak
Lecture Capture	X^2 (20,*N*=227) = 20.41, *p*=.432	.15	Weak
Podcast	X^2 (20,*N*=227) = 17.81, *p*=.600	.14	Very weak
Videos	X^2 (20,*N*=227) = 18.91, *p*=.528	.14	Very weak
Adobe Connect	X^2 (20,*N*=226) = 16.66, *p*=.675	.14	Very weak
RSS	X^2 (20,*N*=226) = 15.79, *p*=.730	.13	Very weak

11 cells (36.7%) have expected counts less than 5.

Further inspection of data identified an association between the use of Skype, and the lecturers' face to face preference for EBL as a teaching method. Results of adjusted p values (*p*=.002) are reported within Table 5.30, illustrating that EBL, a teaching method which embraces learner interaction, was polarised, from never to always, in relation to the lecturers' strong preference for the use of Skype in online learning and teaching. This result suggests that Skype is used by a relatively small number of lecturers, who expressed a preference for EBL as their preferred face to face teaching method. Conversely, the same number of lecturers, who again expressed the preference for EBL, had never used Skype.

Table 5.30: Bonferroni adjusted *p* values; Enquiry based learning /Skype

	Strongly prefer	Least prefer
Never	4.1 (*n*=15); *p*<.001	2.8 (*n*=25); *p*=.005
Always	3.3 (*n*=14); *p*=.001	

A Bonferroni correction was also applied, across EBL and the use of photographs to support online teaching and learning; this concluded that lecturers who expressed strong preference often used photographs (X^2 (2, *n*=28) = 2.7, *p*=.007), in contrast, and conversely, those who expressed least preference for enquiry based learning always used photographs (X^2 (2, *n*=13) = 3.3, *p*=.001). As with the use of Skype, the use of photographs is not significantly associated to the lecturers' preference of EBL as a method of face to face teaching.

Least preferred face to face teaching style: Lecture /web technologies used

Analysing the lecturers' least preferred face to face teaching style: the lecture, and its association to the lecturers' use of web technologies, one statistically significant relationship was highlighted, this reported an association to the use of photographs (X^2 (16, *N*=227) = 42.60, *p*=.002), with Cramer's *v*=.22 reporting an acceptable strength of association (Table 5.31).

Table 5.31: Least preferred face to face teaching style: the lecture, and the web technologies used

	Pearson chi square	Cramer's *v*	Association
Photographs	X^2 (20,*N*=227) = 42.60, *p*=.002	.22	Moderate
Videos	X^2 (20,*N*=227) = 26.61, *p*=.147	.17	Weak
Adobe Connect	X^2 (20,*N*=226) = 23.30, *p*=.274	.16	Weak
Skype	X^2 (20,*N*=227) = 22.84, *p*=297	.16	Weak
Discussion forum	X^2 (20,*N*=226) = 19.19, *p*=.510	.15	Weak
Wiki	X^2 (20,*N*=226) = 19.36, *p*=.498	.15	Weak
Twitter	X^2 (20,*N*=226) = 20.95, *p*=.400	.15	Weak
Lecture Capture	X^2 (20,*N*=227) = 17.86, *p*=.596	14	Very weak
Podcast	X^2 (20,*N*=227) = 12.64, *p*=.892	.12	Very weak
Blog	X^2 (20,*N*=226) = 13.83, *p*=.839	.12	Very weak
RSS	X^2 (20,*N*=226) = 10.33, *p*=.962	.11	Very weak

The significant association revealed by further analysing the data using Bonferroni's adjusted *p* value .002, reported neither an agreed or disagreed preference for the lecture as a face to face teaching method, and the fact that these 11 lecturers had never used photographs to support their online teaching and learning (X^2 (2 ,*n*=11) = 2.50, *p*=.002). This significant association offers little in relation to the lecturers' use of technologies or their engagement with TEL.

Level of engagement with TEL/adoption of technologies

The more widely recognised web technologies include blogs, wikis, RSS feeds, videos, photographs and Twitter, the potential of which can lead to innovation in higher education (Collis & Moonen, 2008). The adoption of innovation, in other words the adoption of technologies, is described synonymously by Rogers (2003), as the diffusion of innovation theory.

Consideration was firstly given to lecturers' engagement with TEL in relation to Rogers' adopter categories (2003): laggard; late majority; early majority; early adopter and innovator. Figure 5.6, on the next page, illustrates that the majority of lecturers, who were fully engaged with TEL (with minimal support), are the 'early adopters' of technology (*n*=58). Only eight lecturers (4%), who described themselves as 'innovators', are fully engaged with TEL (with no support).

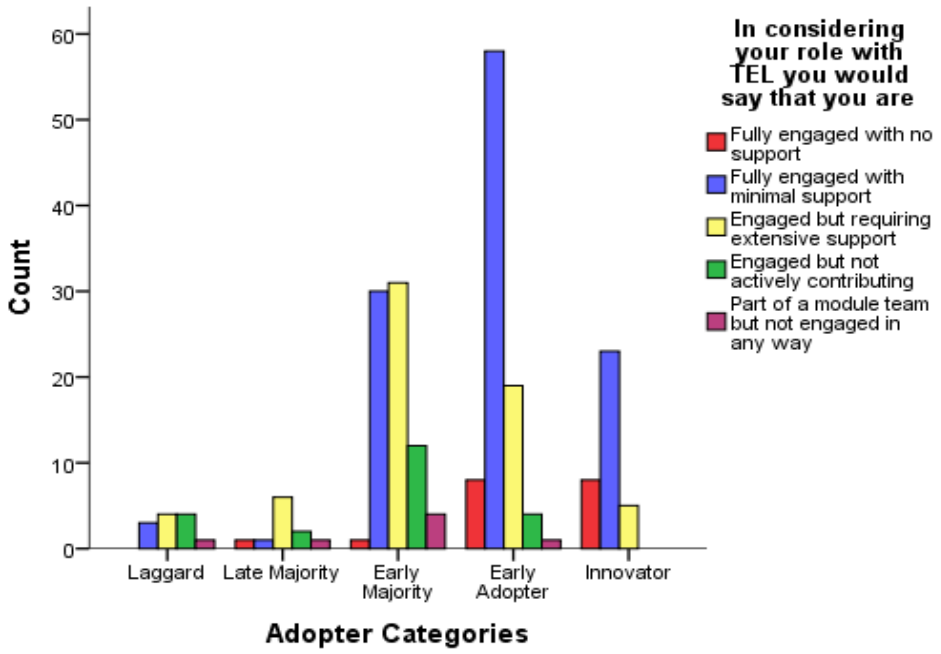


Figure 5.6: Lecturers' engagement with technology enhanced learning in relation to Rogers' (2003) adopter categories

Chi square tests for association were explored to reveal evidence relating to the lecturers' adoption of technologies in relation to the technologies they used. Table 5.32 reports four statistically significant associations between the adopter categories and web technologies used by lecturers: wiki; blog; podcast and Skype.

Table 5.32: Web technologies used in relation to Rogers' adopter categories (2003)

	Pearson chi square	Cramer's *v*	Association
Wiki	X^2 (16,*N*=226) = 75.16, *p*<.001	.29	Moderately Strong
Blog	X^2 (16,*N*=226) = 56.43, *p*<.001	.25	Moderately Strong
Podcast	X^2 (16,*N*=227) = 51.07, *p*<.001	.24	Moderate
Skype	X^2 (16,*N*=227) = 34.52, *p*=.005	.20	Moderate
Discussion forum	X^2 (16,*N*=226) = 33.09, *p*=.007	.19	Weak
Twitter	X^2 (16,*N*=226) = 32.88, *p*=.008	.19	Weak
Photographs	X^2 (16,*N*=227) = 30.84, *p*=.014	.18	Weak
Videos	X^2 (16,*N*=227) = 30.26, *p*=.017	.18	Weak
Lecture Capture	X^2 (16,*N*=227) = 29.32, *p*=.022	.18	Weak
Adobe Connect	X^2 (16,*N*=226) = 22.59, *p*=.125	.16	Weak
RSS	X^2 (16,*N*=226) = 18.88, *p*=.275	.15	Weak

Wiki:

A Bonferroni correction was applied (adjusted p value =.0025), as shown in Table 5.33, across the adopter categories and the use of wikis to support lecturers' online learning and teaching. Seven statistically significant associations were reported; of note is that 42% (*n*=96) of lecturers had never used wikis, seven (out of total of 36) of this number were 'innovators': a further seven 'innovators' often used wikis; whilst nine 'innovators' always used wikis. Only 16 'innovators', out of a total of 36, used wikis to support their online learning and teaching. This result suggests that the 'innovative' lecturers are not using innovative technologies in their online learning and teaching.

Table 5.33: Adopter categories and the use of wikis

	Late Majority	Early Majority	Early Adopter	Innovator
Never	3.1 (*n*=10); *p*=.0019	4.4 (*n*=51); *p*<.0001	3.7 (*n*=28); *p*=.0002	3.5 (*n*=7); *p*=.0005
Sometimes			3.1 (*n*=26); *p*=.0019	
Often				3.0 (*n*=7); *p*=.0027
Always				5.1 (*n*=9); *p*<.0001

Blog:

The Bonferroni correction identified six statistically significant associations between adopter categories and lecturers reported use of blogs: 65% (*n*=51) of 'early majority' lecturers (out of 78) had never used blogs (X^2 (2, *n*=51) = 3.80, *p* <.0001). Table 5.34 reports significance across all levels, for all 36 'innovators' and their use of blogs; almost half of the 'innovators' (*n*=15) often or always utilise blogs for their online learning and teaching.

Table 5.34: 'Innovators' and their use of blogs

Never	X^2 (2, *n*=5) = 4.6 *p*<.0001
Rarely	X^2 (2, *n*=7) = 3.1 *p*=.0019
Sometimes	X^2 (2, *n*=9) = 4.0 *p*=.0001
Often	X^2 (2, *n*=8) = 3.5 *p*=.0005
Always	X^2 (2, *n*=7) = 3.1 *p*=.0019

Podcast:

Six ‘early majority’ lecturers, who sometimes used podcasts, reported a statistically significant association (X^2 (2, n=6) = 3.60, p=.0003), whilst seven ‘innovators’ reported that they always used podcasts (X^2 (2, n=7) = 4.10, p<.0001). The number of lecturers producing podcasts, who conversely, had described themselves as ‘early majority’ adopters of technology, or as ‘innovators’, was very small.

Skype:

There was only one further statistically significant association, this reported 27 ‘early adopters’ of technology (out of 90) had never used Skype (X^2 (2, n=27) = 3.40, p=.0007).

Q4. What relationships exist between the culture of the HEI, as measured by the perceived level of support the lecturer experiences now, and the lecturers’ level of engagement with TEL?

Embedding effective eLearning in HEIs is reported to be dependent on factors such as technological support, institutional culture and investment in staff development. To that extent this question was posed to establish if any relationships were evident to effect the lecturers’ level of engagement with TEL.

Engagement with TEL/Levels of support

Chi square testing revealed a statistically significant association between six independent variables and lecturers’ engagement with TEL. Table 5.35, on the next page, shows engagement with TEL being statistically significant with those lecturers reporting that their educational needs were not being met, and with those who stated that other colleagues did not help them to learn.

There were weaker associations reported between lecturers’ engagement with TEL and the statements:

> ‘*you can rely on others to help you with your online module(s) of learning*;
> *I feel reluctant to speak openly*;
> *I feel confident that others will support me*; and
> *that other members of teaching staff depend on me*’.

Table 5.35: Relationship between levels of support in higher education establishments, and engagement with technology enhanced learning

	Pearson chi square	Cramer's *v*	Association
My educational needs are not being met	X^2 (16,*N*=226) = 38.08, *p*=.001	.21	Moderate
That colleagues do not help me to learn	X^2 (16,*N*=226) = 34.88, *p*=.004	.20	Moderate
That you can rely on others to help	X^2 (16,*N*=226) = 31.15, *p*=.013	.19	Weak
Reluctant to speak openly	X^2 (16,*N*=226) = 29.60, *p*=.020	.18	Weak
Confident that others will support me	X^2 (16,*N*=226) = 29.43, *p*=.021	.18	Weak
That members of the teaching staff depend on me	X^2 (16,*N*=226) = 29.06, *p*=.024	.18	Weak
I am connected to others developing online courses	X^2 (16,*N*=226) = 25.03, *p*=.069	.17	Weak
Uneasy exposing gaps in my understanding	X^2 (16,*N*=226) = 21.44, *p*=.162	.15	Weak
I am encouraged to ask questions	X^2 (16,*N*=227) = 20.77, *p*=.188	.15	Weak
Isolated when developing online materials	X^2 (16,*N*=226) = 18.93, *p*=.272	.15	Weak
Lacking in a spirit of belonging	X^2 (16,*N*=226) = 16.97, *p*=.388	.14	Very weak
Ample opportunity is given to learn	X^2 (16,*N*=226) = 16.56, *p*=.415	.14	Very weak
It is hard to get help when you have a question	X^2 (16,*N*=226) = 15.38, *p*=.497	.13	Very weak
Colleagues care about each other	X^2 (16,*N*=227) = 6.58, *p*=.981	.09	Very weak

Table 5.36 on the next page, reports further exploration, using Bonferroni testing, which revealed associations within four areas:

> *The lecturer's educational needs were not being met;*
> *My colleagues did not help me to learn;*
> *Other members of the teaching staff depended on me; and*
> *Lecturers were reluctant to speak openly*.

Table 5.36: Bonferroni adjusted *p* values; Lecturer support / engagement with technology enhanced learning

	Strongly disagree	Neutral	Strongly agree
1			**Members of the teaching staff depend on me:** 3.1(*n*=8); *p*=.002
2	**Reluctance to speak openly:** 3.3 (*n*=58); *p*=.001 **Colleagues do not help me to learn:** 3.4 (*n*=52); *p*=.001		**Educational needs are not being met:** 3.0 (*n*=3); *p*=.003
3		**Reluctance to speak openly:** 3.1 (*n*=8); *p*=.002	**Educational needs are not being met:** 3.2 (*n*=11); *p*=.001 **Colleagues do not help me to learn:** 3.2 (*n*=4); *p*=.001

Key:
1 = Fully engaged with no support,
2 = Fully engaged with minimal support,
3 = Engaged but requiring extensive support.

The two areas: '*that you can rely on others to help'*; and '*confident that others will support me'*, had confirmed associations above the 1.96 threshold of significance, which also reported associations above the cut-off point of *p*=.002.

The first area, lecturers' engagement with TEL and the fact that they could rely on other members of staff to help them with the development or delivery of online learning, reported a range from *p*=.004 to *p*=.028 across four levels within the variable. The second area, lecturers' engagement with TEL and the fact that they felt confident that others would have supported them in relation to their engagement with TEL, reported two associations (range *p*=.005 – *p*=.016).

Q5. What factors does the lecturer envisage will impact on any future engagement with TEL?

<u>Engagement with TEL/Future impact</u>

Support and engagement with TEL, had a statistically strong association as previously reported. Table 5.10 (p. 86) highlighted a limited number of factors which lecturers reported would impact on their future engagement with TEL: the time it would take them to learn new technologies (67%, *n*=151), the lack of

support staff (43%, *n*=98), and technical problems/unreliable networks (38%, *n*=87.

Q6. What values does the lecturer perceive to be of importance in relation to their employment, does this have a relationship on their motivation to engage with TEL?

By utilising the two-factor theory of motivators and hygiene, it was envisaged that motivation factors could be isolated in order to explore how job satisfaction enhances motivation to engage with TEL. Likewise, hygiene factors, if isolated, could identify job dissatisfaction and thus also impact on the lecturers' engagement with TEL.

Table 5.37: Motivator factors and their association to lecturers' engagement with technology enhanced learning

Motivator factors	Pearson chi square	Cramer's *v*	Association
Chance for promotion	X^2 (16,*N*=226) = 29.72, *p*=.020	.18	Weak
Responsibility	X^2 (16,*N*=226) = 27.60, *p*=.035	.18	Weak
Personal growth	X^2 (16,*N*=226) = 20.23, *p*=.210	.15	Weak
Achievement	X^2 (16,*N*=225) = 16.64, *p*=.410	.14	Very weak
Interesting work	X^2 (12,*N*=226) = 10.55, *p*=.568	.13	Very weak
Opportunity to use your ability	X^2 (12,*N*=224) = 8.03, *p*=.782	.11	Very weak
Influence in the work place	X^2 (12,*N*=226) = 6.67, *p*=.879	.10	Very weak
Recognition for doing a good job	X^2 (16,*N*=225) = 8.04, *p*=.948	.10	Very weak
Meaningful, important work	X^2 (12,*N*=225) = 4.63, *p*=.969	.08	Very weak

Motivation factors:

Table 5.37, on the previous page, reports two statistically significant associations between the motivational factors and lecturers' engagement with TEL: '*chance for promotion'*; and '*being given responsibility (empowerment)'*.

Bonferroni adjustment (*p*=.002) confirmed an association between nine of the lecturers, and the extreme importance they placed on their chance for promotion (X^2 (1, *n*=9) = 3.1, *p*=.002). An association was also confirmed for one lecturer who was fully engaged with TEL (with no support), who highlighted that responsibility (empowerment) was not important to them (X^2 (1, *n*=1) = 3.4, *p*=.001).

Table 5.38: Hygiene factors and their association to lecturers' engagement with technology enhanced learning

Hygiene	Pearson chi square	Cramer's *v*	Association
Interaction with people	X^2 (16,*N*=226) = 48.04, *p*<.001	.23	Moderate
Pleasant co-workers	X^2 (12,*N*=226) = 16.59, *p*=.166	.16	Weak
Good work conditions	X^2 (12,*N*=226) = 14.93, *p*=.245	.15	Weak
Convenient hours	X^2 (16,*N*=226) = 18.59, *p*=.291	.14	Very weak
Job status	X^2 (16,*N*=226) = 17.26, *p*=.369	.14	Very weak
Suitable pay	X^2 (16,*N*=225) = 12.81, *p*=.687	.12	Very weak
Benefits	X^2 (16,*N*=226) = 11.51, *p*=.777	.11	Very weak
A fair boss	X^2 (12,*N*=225) = 7.13, *p*=.849	.10	Very weak
Job security	X^2 (12,*N*=226) = 6.61, *p*=.882	.10	Very weak

Hygiene factors:

Table 5.38, above, reports one statistically significant association between lecturers who placed importance on their role giving them the opportunity to

interact with other people and their engagement with TEL (X^2 (16, *N*=226) = 48.04, *p*<.001), with Cramer's *v*=.23 giving an acceptable strength of association.

With Bonferroni correction applied (*p*=.002) only one association was reported; the opportunity to interact with people was not seen as important by one lecturer, this same person was part of a module team but was not engaged with TEL in any way (X^2 (1, *n*=1) = 5.6, *p*<.001).

Q7. How does the learning style of the lecturer influence their engagement with TEL?

The importance of the lecturer's learning styles is interesting, in particular, as noted by Felder in 1996, where an implication was made, which stated that student success could be affected by their own and their lecturer's learning style(s). Conversely, engagement with TEL might be indicative of a discrete learning style(s), which if isolated could be a determinant of lecturers' confidence and abilities to engage in this area of teaching practice. Figure 5.7, on the next page, presents the lecturers' learning style reported across all four dimensions of the Felder and Soloman ILS (1993).

The majority of lecturers, as shown, reported balanced learning styles in the active versus reflective dimension, the sensing versus intuitive dimension, the visual versus verbal dimension and the sequential versus global dimension.

There was also moderate preference for the active dimension (*n*=48) over the reflective dimension (*n*=27), and a slight moderate preference for the intuitive dimension (*n*=42) over the sensing dimension (*n*=40). Likewise moderate preference for the visual dimension (*n*=67) over the verbal dimension (*n*=21), and finally a moderate preference for the global dimension (*n*=45) over the sequential dimension (*n*=32).

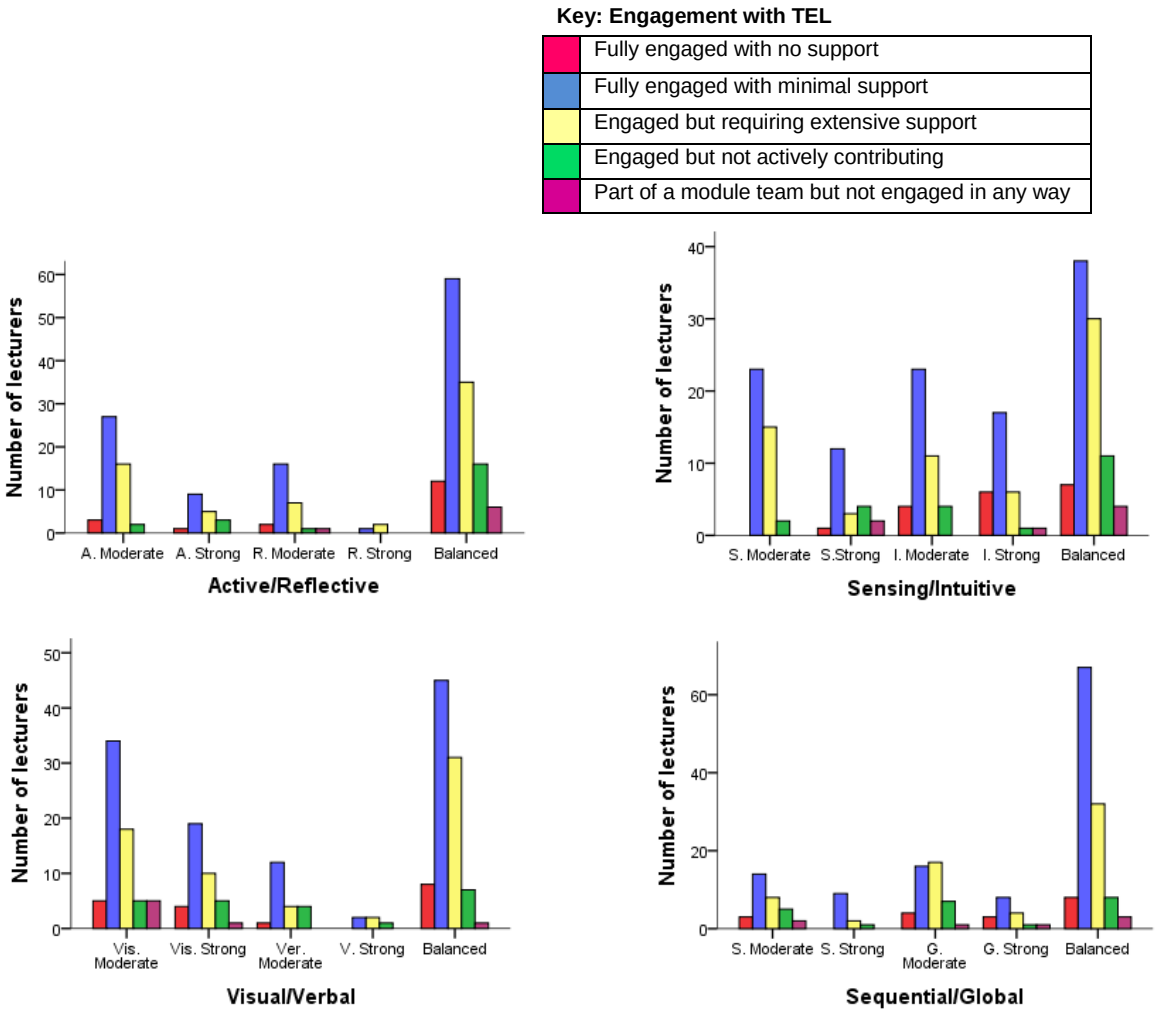


Figure 5.7: Lecturer's engagement with technology enhanced learning in relation to their identified learning style

Table 5.39 reports no statistically significant relationships between the four learning styles and the lecturers' engagement with TEL, however the sensing/intuitive learning style reports a minimally acceptable relationship with Cramer's *v*=.17.

Table 5.39: Relationship between learning styles and lecturers' engagement with technology enhanced learning

	Pearson chi square	Cramer's *v*	Association
Sensing/intuitive	X^2 (16,*N*=225) = 25.13, *p*=.068	.17	Weak
Sequential/global	X^2 (16,*N*=224) = 16.26, *p*=.435	.14	Very weak
Visual/verbal	X^2 (16,*N*=224) = 12.89, *p*=.681	.12	Very weak
Active/reflective	X^2 (16,*N*=224) = 12.12, *p*=.735	.12	Very weak

5.2.2.2: Tests for correlation

Tests for correlation on non-parametric data utilise the Spearman rank order correlation or Spearman's rho (r_s). Correlation using Spearman rho, measures the strength of relationships between two ranked variables reporting any value between -1 and +1 (Field, 2009).

Table 5.40 on the next page, presents the correlations of all of the research variables and their reliabilities. None of the factors exhibited significant relationships with the dependent variable TEL.

Table 5.40: Correlation and reliabilities amongst variables

VARIABLES	0	1	2	3	4	5	6	7	8	9	10	11	12
0 Engagement with TEL													
1 Years of Service	.464	(n.a.)											
2 Computer Skill	.233	.345	(0.65)										
3 Computer Exposure	.529	.278	.051	(0.80)									
4 Teaching Style	.687	.165	.656	.932	(n.a.)								
5 Anticipated Consequences of Use	.405	.064	.000 .434*	.005 -.186*	.516	(0.89)							
6 Utilisation	.616	.923	.000 -.308*	.000 .305*	.616	.000 -.375*	(0.81)						
7. Impact	.320	.010 .172*	.000 .331*	.000 -.307*	.933	.000 .319*	.000 -.267*	(0.83)					
8. Attitude Towards Using	.185	.973	.000 -.319*	.000 .491*	.956	.000 -.275*	.000 .397*	.000 -.431*	(n.a.)				
9. Task-Technology Fit	.688	.698	.024 -.150**	.000 .345*	.915	.000 -.250*	.001 .229*	.000 -.288*	.000 .291*	(0.92)			
10. Lecturer Support	.324	.584	.011 .169**	.125	.098	.028 .147**	.064	.000 .312*	.018 -.157**	.305	(0.86)		
11. Work Motivation Values	.727	.255	.256	.048 .134**	.972	.577	.549	.257	.803	.000 .274*	.299	(0.88)	
12.1 Learning Style Inventory: Active Reflector	.752	.183	.406	.629	.054	.733	.309	.320	.715	.634	.643	.078	(n.a.)
12.2 Learning Style Inventory: Sensing Intuitive	.584	.065	.534	.916	.494	.927	.885	.528	.807	.066	.484	.507	(n.a.)
12.3 Learning Style Inventory: Visual Verbal	.723	.280	.347	.188	.385	.182	.025 -.150**	.490	.097	.025 -.150**	.771	.914	(n.a.)
12.4 Learning Style Inventory: Sequential Global	.647	.880	.333	.692	.899	.120	.777	.704	.856	.749	.582	.217	(n.a.)

Note: Reliabilities (Cronbach's Alpha) are shown in parenthesis.
n.a. = not applicable

KEY:

*Correlation is significant at the 0.01 level (2 tailed)
**Correlation is significant at the 0.05 level (2 tailed)

Table 5.41 below, reports those relationships which revealed positive correlations, significant at 0.01 and 0.05 (2 tailed). The strongest correlation was between the lecturers' reported attitude towards their adoption of technologies, and the web technologies they used to support their online learning and teaching (r_s=.491, p<.001).

There was a moderate positive relationship reported between the lecturers' anticipated consequences of working with computers and their feelings relating to the work they did with computers (r_s=.434, p<.001).

The weakest positive correlation was between the factors which were reported as having an impact on the lecturers' future engagement with TEL, and the number of years' service they had worked within HEIs (r_s=.172, p=.010).

Table 5.41: Positive correlations resulting from Spearman's rho (r_s) analysis

	r_s	*N*
Attitude towards using and computer exposure	.491*	**225**
Anticipated consequences of use and computer skills	.434*	**224**
Attitude towards using and utilisation	.397*	**226**
Task-technology fit and computer exposure	.345*	**225**
Impact and computer skills	.331*	**225**
Impact and anticipated consequences of use	.319*	**225**
Lecturer support and impact	.312*	**225**
Utilisation and computer exposure	.305*	**224**
Task-technology fit and attitude towards using	.291*	**226**
Work motivation values and task-technology fit	.274*	**219**
Task-technology fit and utilisation	.229*	**225**
Impact and years of service in HE	.172*	**226**
Lecturer support and computer skill	.169**	**225**
Lecturer support and anticipated consequences of use	.147**	**224**
Work motivation values and computer exposure	.134**	**218**

Note: * p< 0.01. ** p< 0.05.

Table 5.42 reports the negative correlations which demonstrated significance at 0.01 and 0.05 (2 tailed). The strongest was between the lecturers' reported attitude towards their adoption of technologies, and what in the future would impact on their engagement with TEL. This result suggests that as lecturers' receptivity to innovation increases, the barriers relating to engagement with TEL in the future, will decrease (r_s= -.431, p<.001).

Table 5.42: Negative correlations resulting from Spearman's rho (r_s) analysis

	r_s	*N*
Attitude towards using and impact	-.431*	226
Utilisation and anticipated consequences of use	-.375*	225
Attitude towards using and computer skill	-.319*	226
Utilisation and computer skill	-.308*	225
Impact and computer exposure	-.307*	224
Task-technology fit and impact	-.288*	225
Attitude towards using and anticipated consequences of use	-.275*	225
Impact and utilisation	-.267*	226
Task-technology fit and anticipated consequences of use	-.250*	224
Anticipated consequences of use and computer exposure	-.186*	223
Lecturer support and attitude towards using	-.157**	226
Task-technology fit and computer skill	-.150**	225
LSI: Visual verbal and utilisation	-.150**	223
LSI: Visual verbal and task-technology fit	-.150**	224

Note: * p< 0.01. ** p< 0.05.

5.3.2.3: Tests for variance

For non-parametric data the Kruskal-Wallis test is used to determine if there are statistically significant differences between two or more groups. The test is based on four assumptions being met within the data: the data includes Likert scales or ranking; the groups must be independent of each other; different participants must be in each group; and finally, distribution must have the same shape.

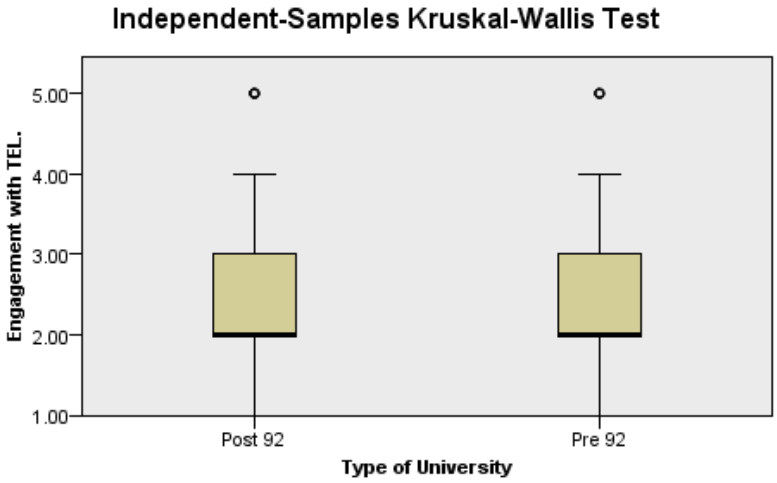
The UCISA surveys, have identified substantial distinctions between Pre-92 and Post 92 universities with respect to TEL, which since 2008 have remained relatively unchanged (Browne and Jenkins, 2008; Walker et al., 2014). Table 5.43 presents a summary from the 2014 survey to highlight reported differences.

Table 5.43: Summary of technology enhanced learning differences between Pre and Post-92 universities; adapted from Walker et al. (2014)

Pre-92	Post-92
Have dedicated TEL or e-Learning strategy to inform TEL development	Corporate strategy influences TEL development
Dedicated Information Technology Support Units	Dedicated support units reported to be up from 58% in 2012 to 72% in 2014
Lack of support staff/specialist skills/resources	Staff development noted as the leading challenge: Dissemination channels for TEL practices as a way of raising awareness amongst staff of the benefits of TEL tools; More attendance at ALT and HEA activities, and regional seminars
MOOCs making demands on support systems	MOOCs were of limited concern
Most commonly possessing departmental platforms in addition to the main institutional VLE	Using FutureLearn platform
Increasing use of web conferencing tools; Identity management systems; Lecturer management systems;	
Lack of recognition for career development	
More likely to outsource support for VLE	Outsource e-portfolio provision
More likely to collaborate	
Lecture capture was the leading development and classroom interactivity being used	Mobile technologies as the leading development making demands; loaning out of mobile devices significantly increased.

Browne and Jenkins (2008) proposed that the changes may be due to the lack of engagement by academic staff to the potential of introducing new technologies into their teaching and learning, evidence however, cannot substantiate this proposal. Traditionally, universities have published strategic plans relating to research and education, some are changing however, and have now included a balance between education, research, and increasingly the inclusion of

innovation (Livesey, Sullivan, Hughes, & Valli, 2008). It was therefore of interest to examine lecturers' engagement with TEL for differences across Post 92 universities (*n*=166) and Pre 92 universities (*n*=61). Figure 5.8 presents the distribution of scores, which on visual inspection of the boxplot, were seen to be very similar.



Total N	227
Test Statistic	.282
Degrees of Freedom	1
Asymptotic Sig. (2-sided test)	.596

Figure 5.8: Type of university in relation to the lecturers' engagement with technology enhanced learning

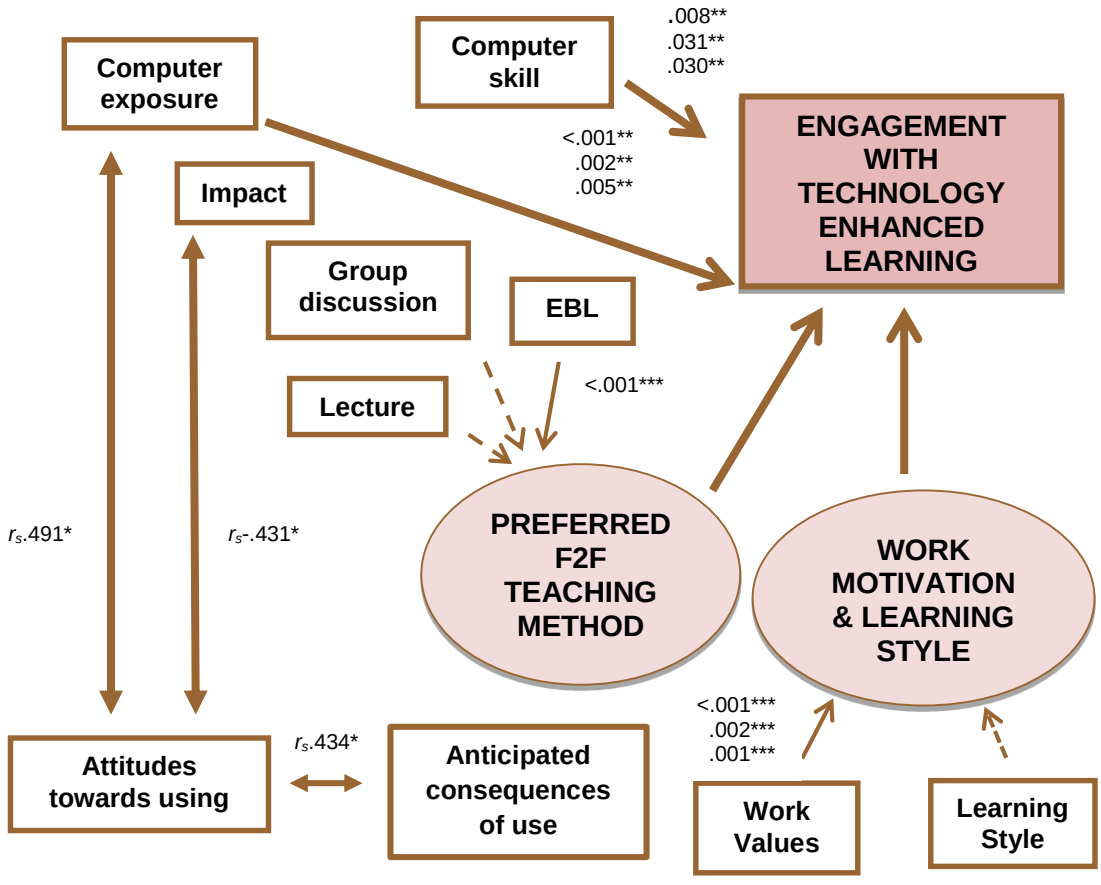
Median scores for the lecturers' engagement with TEL were not statistically significant between the different types of university where the lecturers in this study were employed (X^2 (1) =.282, *p*=.596). This suggests that the university's historic standing does not impact on innovation in the form of TEL.

5.3: Summary

This chapter presented the main study recruitment and data collection process, as well as analysis of the results from a survey exploring the associations and

relationships between UK HEI lecturers and their engagement with technology enhanced learning. The statistical methods employed have followed a purist approach to non-parametric testing and have included both descriptive statistics and inferential statistics.

Forty-nine UK universities took part in the study, represented by 227 lecturers from a range of health science professions. Figure 5.9 presents the main findings, in relation to the research study's conceptual model (Figure 3.3, p. 38), which are briefly summarised below.



KEY: * *p*=.01; ** *p*=.05; * *p*=.002**

Figure 5.9: Main study findings presented in relation to the conceptual model

- Fifty-one percent (*n*=115) of lecturers reported full engagement with TEL, with only minimal support needed.

- Significant associations were reported between the lecturers engagement with TEL and:

    - The difficulty of working with computers (computer skill);
    - The psychological stress created when working with computers (computer skill);
    - The technical ability required to work with computers (computer skill);
    - The range of web technologies used: videos, wikis and discussion forums (computer exposure);
    - Preference of face to face teaching method (EBL);
    - Organisational support: promotion, job security and interaction (work values).

- Whilst lecturers' learning style reported no association to their engagement with TEL, the results are nevertheless of interest

- Most preferred face to face teaching methods: EBL and Group discussion

- Least preferred face to face teaching method: Lecture

- Correlations revealed no significant relationships with the dependent variable, engagement with TEL, however, strong relationships emerged between ranked independent variables :

    - The strongest positive correlations were between lecturers' attitude towards their adoption of technologies, and the web technologies used to support online learning and teaching (computer exposure), and, between lecturers' attitude towards their adoption of technologies, and the anticipated consequences of use .
    - The strongest negative correlation was between lecturers' attitude towards their adoption of technologies, and what in the future would impact on their engagement with TEL.

In Chapter Six, the findings will be discussed in relation to previous literature, and their contribution to the current evidence base. Limitations of the study, implications for practice, and further research will also be presented.

Chapter 6 - DISCUSSION, LIMITATIONS, IMPLICATIONS FOR PRACTICE AND FURTHER RESEARCH RECOMMENDATIONS

Chapter Six firstly returns to the researcher's suggested conceptual model and subsequently the research questions, to discuss the results of the data analysis. Limitations are then presented, followed by implications of the findings. Lastly, recommendations for further research are presented.

6.1: Discussion

This study was designed to identify relationships and associations between lecturers' engagement with TEL. The variables gathered for this study were based on a review of the literature, which was informed through personal and professional knowledge in this area of practice. Developing a theoretical framework, from the literature reviewed, identified new ways of looking at lecturers' engagement with TEL, this subsequently enabled a potential conceptual model to be created. The conceptual model, presented in Chapter Three, depicts the complexity of relationships and associations in a methodological manner in order to illustrate the major factors within five dimensions, how these relate to each other, and influence engagement with TEL.

With web technologies becoming more popular in the everyday lives of students (Bennett, et al., 2012), it is crucial that education delivery, particularly in health and social care, where technology is increasingly being used, embraces new approaches to learning and teaching. The findings from this study did not fully determine the predictive power of the independent variables within the five dimensions of the conceptual model: namely, Demography and Background information; Preferred face-to-face teaching method; Perception of the VLE; Culture; and finally, Work motivation and Learning style. However, through examining these five dimensions, evidence emerged to suggest other dynamic relationships and associations which add to our understanding of lecturers' engagement with TEL, and, could support Higher Education faculty level solutions for increasing lecturers' participation with TEL for the future. The study's

results validated the initial interest posed, which set out to explore the dynamics of lecturers' engagement with TEL.

6.1.1 The conceptual model

The conceptual model shown in Figure 5.9 describes the significant relationships depicted by the direction of the arrows, between the independent variables representing Preference of face to face teaching method: enquiry based learning; group discussion; and lecture; and the dependent variable, Engagement with TEL. Values and learning styles, representing the dimension: Work motivation and Learning style were also significantly related to Engagement with TEL. The independent or predictor variables, for computer skill and computer exposure were both associated with Engagement with TEL. The findings of this study also revealed positive correlations between ranked independent variables: lecturers' attitude towards their adoption of technologies and the web technologies they used (computer exposure), and, lecturers' attitude towards their adoption of technologies and their anticipated consequences of use. Two negative correlations were revealed between the ranked independent variables lecturers' attitude towards their adoption of technologies, and what in the future would impact on their engagement with TEL.

The results from this study, therefore, confirm many of the dimensions of the proposed conceptual model, although in relation to engagement with TEL, there is one unexplained area. Culture of the higher education institution is one dimension which, in this study, remains unexplained, suggesting that expansion and development of the model, to expand the area of lecturer support may be needed to explore this dimension in greater detail. The areas of utilisation and task technology fit, within the Perceptions of the VLE dimension, confirmed lecturers' confidence in working with computers and the use of VLEs in their module delivery, suggesting that both are now accepted as 'tools of the lecturers trade', their use does not in any way influence engagement with technology enhanced learning.

What follows is a discussion of the findings in relation to the research questions posed, current literature and the knowledge obtained.

6.1.1: eCompetence.

The first research question guiding this study asked: “How does the level of engagement with TEL relate to the length of employment held by the lecturer, the beliefs held in relation to working with computers, and, the use of web technologies?

The demography of the respondents revealed that two hundred and twenty lecturers (out of a total of 227 respondents) were engaged with TEL albeit at differing levels. Self-reported engagement with TEL ranged across all five levels, from fully engaged requiring no support, engaged but requiring minimal support, fully engaged but requiring extensive support, engaged but not actively contributing, to part of a module team, but not engaged with TEL. Over half of the lecturers; 51% (*n*=115), reported that they were fully engaged with TEL, and required only minimal support. From this number, 84% (*n*=76) had been employed within HE for over 15 years. This finding was of interest as it combined a unique perspective which disputed previous research suggesting that with increased number of years of teaching, computer proficiency would be decreased (Inan & Lowther, 2010).

Amin (2013) compared learners under 20 years of age; the ‘digital natives’, with the so named ‘digital dinosaurs’; lecturers above 40 years of age, suggesting that the learner belongs and the lecturer does not belong, to the digital age. Although learners in this study were not surveyed, it may have been useful to explore the age range of students undertaking health related courses, from the universities taking part in this study, in order to quantify the so named digital divide. If, as reported by Krause (2007) this digital divide is the fuel to radically change education, the current research study, at face value, suggests evidence of changes having already been made in relation to increased computer proficiency.

The majority of today's full-time undergraduates are the first generation of ‘digital natives’ (HESA, 2015). In other words, 80% of full-time students, i.e. those aged between 18 and 21 years of age, were born after the digital revolution, they are skilled and knowledgeable, in relation to what could be conceived by adults over 40 years of age, in utilising new ways of working, for example in using computers, in using technologies for communicating, and in using technologies for entertainment. Conversely, HESA (2015) report that the majority of part-time

students studying for a first degree are over the age of 30 (55%), with another 64% of students, over 30 years of age, studying other part-time undergraduate studies. Whilst this research cannot corroborate the age range of students within the universities represented in this study, anecdotal evidence would suggest that students accessing health related programmes of study are of diverse age ranges, particularly those undertaking part-time study.

It is interesting to note that there was no significance, relating to the number of years of teaching experience, reported in research conducted by Mueller, Wood, Willoughby, Ross, and Specht (2008), although Yuen, et al., (2011) reported statistical significance relating to years of teaching experience and lecturers' overall experience with web 2.0 tools in learning and teaching. Lecturers at all stages of their career, as revealed in this research study, appeared to be embracing new ways of working, albeit with a limited number of web 2.0 technologies.

In contrast with Inan and Lowther's (2010) suggestion that computer proficiency decreases with the number of years in teaching, the findings of this study demonstrated that working with computers was perceived by 89% (*n*=202) as not being difficult; not complicated by 84% (*n*=190), and was definitely not just for the young, as expressed by 97% (*n*=201). Evidence of a strong relationship between 29% (*n*=59) of lecturers' who required extensive support, but who were nevertheless engaging with TEL, and the ease with which they work with computers, suggests a contradiction to Inan and Lowther's (2010) findings. The result indicated that computer use in general was easy, creating no difficulty for these lecturers, whereas their engagement with technologies, in the creation of online learning and teaching, required extensive support.

Being cognisant of new technologies, and as Schneckenberg, Ehlers and Adelsberger (2011) suggest, because educational practices in universities are slow to respond, competence development and increased value on available time for development, may therefore need to be supported in higher education.

Furthermore, and of interest, are the findings reporting the lecturers' use of web technologies, particularly in respect of those technologies never used i.e. blogs, wikis, podcasts, lecture capture, Adobe Connect, Really Simple Syndication, Twitter and Skype. Blogs, wikis, and social networking are examples of web 2.0

applications. They enable a different pedagogical approach whereby students take an active role in their learning, which as Newland and Byles (2014) suggest, requires a high level of support. These findings paralleled the work of Gebre, Saroyan and Bracewell, (2014) and Mishra and Koehler (2006), who found that in order to ensure effective use of technology in lecturers' teaching, the content of development programmes for technology integration need to address competence, as well as pedagogical and technological dilemmas.

Equipping lecturers with technology, but failing to provide them with appropriate training, leads to technology and computer anxiety according to Redmann and Kotrlik (2009). The findings from Redmann and Kotrlik's study (2009) contrast with the results of this study, in that lecturers who were engaged with TEL but required extensive support, agreed that working with computers created psychological stress, whilst those fully engaged with TEL, requiring minimal support, strongly disagreed that working with computers created psychological stress. This result mirrors the similarity experienced when learning any new skill, for example learning to drive, or engaging with simulation in a clinical setting. At first, what can appear to be a set of complex actions, which need to be co-ordinated and understood, can be daunting, and is generally expressed as such. Through repeated supported exposure, the cognitive and psychomotor skills gained in using web technologies in an online environment, increase until mastery is achieved. As Oye et al. (2012) report, stress and anxiety usually occur when something new is being learnt, the role of support, in reducing this temporary condition cannot therefore be overlooked.

Web technologies most frequently used to support the lecturers' online learning included videos (71%; *n*=160), photographs 64%; *n*=145) and discussion forums 46%; *n*=104); this is consistent with the findings from research conducted by Newland and Byles (2014) which concluded that many academics use a VLE to upload electronic resources such as lecture materials, PowerPoint slides and reading lists; described by Shelton (2013) as "core" technologies.

Also of interest was the moderate relationship between different levels of lecturer engagement with TEL and the use of wikis. Nineteen percent of lecturers (*n*=42) had never used wikis and although they were engaged with TEL, they required extensive support. Conversely five lecturers, out of a total of 18 (28%) who were

fully engaged with TEL with no support needed, often used wikis. This latter result is consistent with the findings of a previous investigation of lecturers' perceptions of technology and the specific technologies they frequently used (Shelton, 2013). Overall, increased socialisation through the use of web technologies such as wikis, reported mixed findings. Wikis are a useful online tool for collaborative writing, which require planning, design, and effective facilitation. Embracing their potential, takes time and support, which once mastered, supports student-centred, collaborative learning, reflexive of pedagogy 2.0.

There is an argument posed that academic staff may be reluctant to develop pedagogical skills in online environments as the reward system in some universities is heavily weighted in favour of research rather than teaching excellence (Owens, 2012). Salmon (2005) previously highlighted this point by suggesting that it was likely spiralled in research-intensive Russell Group universities, although in this study there was no reported statistical significance between lecturers' engagement with TEL and their employment within Russell Group/Pre 92 universities and those referred to as Post 92.

6.1.2: The nature of engagement

The second research question asked: How does the lecturer perceive their computer use, their beliefs about VLE usage, what impact does this have on their engagement with TEL?

Web technologies which reflect constructivism and pedagogy, but in this study were never used by lecturers in their online learning and teaching, included: blogs (49%, *n*=110); wikis (46%, *n*=104); Skype (44%, *n*=99), and Adobe Connect (72%, *n*=164). These findings paralleled the research of Owens (2012) and Ajjan and Hartshorne (2008), who found that university lecturers have in general, failed to develop their face to face interactive teaching practices to online learning environments. This group of web 2.0 technologies have a high profile in education literature and are widely supported in universities, but as researched by Shelton (2013), appear to have a low uptake among academics. Shelton's research parallels the findings from this study, reporting statistical significance between enquiry-based learning and the use of Skype (2015). Skype enables effective, knowledge experience sharing, according to Laurillard (2007) involving

interactive audible chat, as well as a sharing facility for video and document transfer.

Of further interest, and identified through in-depth analysis, were the polarised responses relating to lecturers' use of Skype, and enquiry based learning as their reported preference of face to face teaching method. The moderately positive correlation was consistent with the findings from a previous investigation of synchronous interaction using Skype and its relationship to online learning and teaching (Strang, 2012). Conversely, the results from this study also revealed comparable numbers of lecturers who had never used Skype in their online teaching, although their preferred face to face teaching method was expressed as EBL. Whilst the use of Skype is not synonymous with online learning, the concept of face to face, two-way communication can strengthen the learning and teaching experience. Strang (2012) agrees, arguing that no amount of asynchronous discussion can surpass the online effectiveness of using real-time dynamic combination of human voice, text-chatting, document sharing, and video. Lingard's research also made reference to lecturers' use of technologies, stating that although they had an awareness of Skype, they do not use it to support their online learning and teaching (2007). These findings conflict somewhat with earlier reports by Trigwell and Prosser (1996) and Kirkwood (2009), in that the lecturers' preference for face to face teaching style, did not mirror the concepts adopted for online delivery i.e. the active, facilitated, question driven, constructivist nature of EBL.

The use of photographs in online learning, as favoured by 64% (*n*=145) of lecturers, suggested a somewhat simplistic adoption of technology, but for health science lecturers, visual presentation of ethical or culturally sensitive material might be best displayed using this medium. Meeting the learning needs of students, can be done more effectively than by face to face teaching through the provision of permanent visual resources, for example anatomy, where hands on teaching may not always be possible. Although there is a dearth of research relating specifically to the use of photographs in online learning and teaching, there is evidence to suggest the value of photography in health sciences literature (Bloomfield & Jones, 2013; Killion, 2001; Palaigeorgiou, Triantafyllakos, & Tsinakos, 2011). Westberry, McNaughton, Billot, and Gaeta, (2014) have argued that it is imperative for technological changes to be introduced in a way that is

aligned with lecturers' current knowledge and ways of working. In the context of health sciences, innovative technology does not automatically equate with better learning (Lawson, Comber, Gage, & Cullum-Hanshaw, 2010). Where some interactive web 2.0 technologies are seen as being important in the support of healthcare intervention, it is important to recognise the value of supporting online learning and teaching with a medium which is conducive to the learning outcomes of the session being delivered. If that means the utilisation of a web 1.0 technology, then this should be evaluated in its clinical context.

Forty percent (*n*=90) of lecturers in this study, categorised themselves as early adopters of innovation. Rogers' (2003) classic diffusion of innovation theory summarises the 'early adopters' as people that like new web technologies and use them before most other people. The 'early adopters' are often seen as change agents; the role models who provide advice and information about innovations to others. However, when analysing this detail in more depth, it would appear that whilst lecturers perceived themselves to be role models in relation to cascading innovation to others, they were not in fact utilising innovative technologies in their online teaching. Implying that although they perceived themselves as early adopters of technology innovation, in reality, this was not reflected in the web technologies they used. Technological innovation is not clearly defined within the literature, but consensus implies the combination of digital technologies and creative pedagogies to encourage innovation in teaching and learning, examples of technologies include wikis, blogs, podcasting and document sharing (Edwards & Bone, 2012; Nworie, 2014).

Table 6.1: Early adopters use of web technologies

	Never	Rarely	Sometimes	Often	Always
RSS	61	14	10	3	2
Adobe Connect	59	15	7	7	2
Twitter	49	14	10	9	8
Blog	37	16	25	8	4
Lecture Capture	32	19	19	16	4
Wiki	28	25	26	9	2
Podcast	28	17	25	17	3
Skype	27	18	16	18	11
Photographs	10	9	8	30	33
Videos	6	6	11	30	37
Discussion Forum	5	22	21	27	15

Table 6.1, on the previous page, depicts the ‘early adopters’’ use of web technologies reported in this study; over half had never used RSS feeds (68%), Adobe Connect (66%), or Twitter (54%) in their online learning and teaching, and half of them had either never or rarely used Lecture Capture (57%), wikis (59%), podcasts (50%) or Skype (50%). The results show that lecturers adopted simple technologies i.e. photographs, videos and discussion forums, rather than adopting what may be perceived as more complex technologies. Previous research in this area is sparse, although these findings parallel the work of Cochrane et al., (2012) who found ‘early adopters’ did little beyond using an online management systems for storing information. Aldunate and Nussbaum (2013) agree, stating that depending on what the technology is determines how and when it is adopted; the more complex the technology, the longer it takes to adopt it.

The origins of Rogers’ (2003) research was based on the amount of time taken for individuals to adopt innovation, suggesting that people are inherently more or less predisposed to innovative behaviour. Adoption rates followed normal distribution which suggests a small percentage of early adopters, a large group of early and late majority (mainstream adopters) and a small percentage of late adopters (Straub, 2009). This study revealed a negative skew, with a ‘tail’ of cases reporting low scores across the adopter categories of laggard and late majority (see Figure 5.3, Ch. 5, p. 87). This is an important finding, as in essence, when compared with Rogers (2003) theory, the adoption of new technologies has significantly increased, with fewer individuals categorised as laggards and late majority. This reported increase, as shown in Table 6.2, is consistent with the findings from Yuen et al’s (2011) more recent research involving the adoption of technology enhanced learning. Yuen et al’s online quantitative study examined 368 teachers’ experiences relating to their perception of web 2.0 technologies in their teaching, the majority of respondents, 64%, were over 40 years of age.

A finding also supported by Loogma, Kruusvall, & Ümarik’s (2012), quantitative research, which surveyed 273 vocational secondary and professional higher education teachers in relation to their innovativeness and acceptance of elearning, reported normal distribution, whilst highlighting a reported increase in the innovator and early majority categories. Rogers (2003) classic theory of innovation diffusion, reports that technological innovation follows a relatively

universal pattern of behavioural change, although as in this study, and that of Yuen et al's (2011) the reality is in fact an increase in the adoption of new technologies.

Table 6.2: Comparative findings of normal distribution

Description	Adopter category	Rogers (2003)	This study	Yuen et al (2011)	Loogma et al (2012)
I am sceptical of new web technologies and use them only when I have to.	Laggard	16%	5%	4%	18%
I am usually one of the last people I know to use new web technologies.	Late Majority	34%	5%	6%	24%
I usually use new web technologies when most people I know do.	Early Majority	34%	34%	40%	37%
I like new web technologies and use them before most people I know.	Early Adopter	13-14%	40%	32%	17%
I love new technologies and am among the first to experiment and use them.	Innovator	2-3%	16%	19%	5%

Given that the majority of lecturers perceived themselves as 'early adopters', it was of interest to report a positive correlation between use of web technologies and adoption of innovation (r_s=.491, n=225, p<.001), supporting previous research findings reported by Redmann and Kotrlik (2009), and Teo (2008). This positive correlation can be fostered through faculty dedicated support, so that as the lecturers' confidence in the use of web technologies increases, so too will their continued adoption of new technologies.

6.1.3: Computer confidence

To answer research question three: What relationships exist between preference of face to face teaching method, engagement with TEL, web technologies a lecturer uses to support online teaching, and attitude towards using a VLE?

Kirkwood and Price (2011b) reinforced the concepts of teacher-centred or learner-centred approaches to face to face teaching, stating that they are interrelated to how lecturers' employ technology. The findings from this study identified that group discussion (31%, *n*=67), closely followed by enquiry based learning (30%, *n*=66) were the most preferred face to face teaching methods which lecturers' employed, with the lecture being the least preferred by 54% (*n*=117). Group discussion and enquiry based learning methods support constructivist notions of learning, both of which are reflexive of student-centred approaches to teaching as defined by Richardson (2005). The lecture is further defined as a knowledge transmission/teacher-centred approach to teaching, which, along with student-centred approaches in traditional face to face teaching has been widely researched (Postareff, et al., 2008; Stes & Van Petegem, 2012). The distinction between teacher-centred and student-centred approaches to teaching and learning have not, according to Owens (2012), been researched in an online learning environment.

This study found that only 12 lecturers', who expressed a strong preference for enquiry based learning, reported to be fully engaged with TEL (with no support) (*n*=12, *p*<.001). In essence this meant that only 12 lecturers, who self-reported full engagement with TEL, involved learners as active participants in the online teaching and learning process. Exposing the gap between the lecturers' preference for face to face teaching style and their online practices may well be indicative of the need for staff development. Arguably the remaining lecturers, who stated their preference for EBL or group discussion, could hold different pedagogical beliefs in relation to their engagement with TEL, which again has implications for staff development.

From the results of the correlation analysis, evidence was provided which confirmed that as lecturers increasingly felt more at ease using computers, their skills in using computers increased (r_s=.434, *n*=225, *p*<.001). There was also a strong indication that lecturers were generally confident performing essential

tasks relating to computer operations, although no statistically significant relationships were evidenced between their engagement with TEL and their views relating to computer use. These findings are consistent with those reported in Mueller et al's. (2008) research where they note that general computer exposure is less critical than task-relevant experiences. This result is also consistent with the findings of Inan and Lowther's (2010) study, where a relationship was evident between lecturers feeling comfortable with computers and their readiness to integrate technology into their teaching. This is of interest as from the 28% (*n*=65) of lecturers, who openly shared that their engagement with TEL required extensive support, 33% (*n*=20) of this number had a statistically significant relationship reporting that new features of the VLE were not easy to learn. From a research perspective this result demonstrates the need for support, as new features, such as those within a VLE, are difficult to master. Given that the lecturers in this study are keen to embrace online learning and teaching in the future, it is timely for faculty to support and enhance instruction in this area of professional development.

The majority of lecturers in this study used Blackboard 61% (*n*=139) as their VLE, which Logan and Neumann (2010) report as being uninspiring, and in need of a dedicated team to show lecturers how to use it. Any perceived barrier can have a negative effect on its use, where, instead of increasing engagement, the use of computers and technology can decrease, hence support and encouragement are key to success. Of note was the negative correlation between 'attitude towards using' and 'impact' (r_S= -.431, *n*=226, *p*<.001), which suggested that as the lecturers' receptivity to innovation increased, the barriers relating to their engagement with TEL would decrease. Conversely, as the barriers to engagement with TEL increased, this would be accompanied by a decrease in use of web technologies.

On a positive note, there was statistical significance from lecturers who were fully engaged with TEL (requiring minimal support) confirming strong agreement that the VLE was easy for students to understand, a finding previously reported by Lyndon and Hale (2014), and Osgerby (2013). This result could imply that lecturers who were fully engaged with TEL, had the confidence to maintain and fully utilise the features of a VLE, so much so that their students found navigation and engagement easy.

6.1.4: Past, present and future: the role of support

Research question four and Research question five asked a number of questions regarding the role of support both now and in the future.

Research question four: What relationships exist between the culture of the HEI, as measured by the perceived level of support the lecturer experiences and their level of engagement with TEL, was answered through statistical analysis.

Connectedness is a concept which is associated with 'learner to learner' or 'learner to lecturer' connections. The concepts utilised in this study were drawn from research which reported learner to learner connectedness (Rovai, 2002), but in this study have been used to report lecturer to lecturer connectedness. More recent research has found that online communities create an environment of shared activities that result in increased learning and success in online courses (Pate, Smaldino, Mayall, & Luetkehans, 2009). Rovai (2002) also reported that learners with a low sense of community probably felt isolated and are potentially the ones that would dropout when undertaking online courses. The findings relating to exploring connectedness in this study are interesting, as overall, the positive support the lecturers' experienced, demonstrated little difference across all levels of their engagement with TEL. Of those lecturers who were engaged with TEL (with minimal support), the strongest association, which indicated a supportive culture within the HEI, was between the support they received from peers, and the openness in which they could speak. There were also strong associations between lecturers engaged with TEL (but requiring extensive support), who reported that their educational needs were not being met (n=11), and the same association for those lecturers engaged with TEL (with minimal support) (n=3). Members of the teaching staff "depend on me", was reported by a small number of lecturers who were fully engaged with TEL (n=8, p=.002), which in reality suggested that half of the lecturers who were fully engaged with TEL, were being relied upon for peer support. These numbers were all relatively low, but as reported by Kerres (2005) cited by Schneckenberg & Wildt, (2006, p. 29), academic staff play a key role in education innovation and role modelling for their peers, and as such need to be valued and supported by faculty.

The lack of available time to learn new technologies, or to innovate in teaching, is a theme that has resonated for some time in the literature. In this study 67%

(*n*=152) of lecturers emphasised that time was needed to learn new technologies. This result is consistent with the findings of a recent investigation by Reed (2014), where lack of time, as a significant barrier to engaging with TEL, was reported by 61% (*n*=61) of lecturers in one faculty of health and life sciences. The lack of time has also been reported by UCISA as the leading barrier to TEL development, consolidating its position at the top of the list of barriers every year since 2005 (Walker et al., 2014). These findings confirm that time has been a constant feature raised by staff as a barrier to TEL, which to date remains unaddressed (Adams, 2004; Brown, 2012; Childs, Blenkinsopp, Hall, & Walton, 2005; White, 2007).

Although staff development programmes feature as being integral to successful technology adoption, their sporadic introduction, as reported in this study, remain a barrier to lecturers' engagement with TEL (Button, Harrington, & Belan, 2013).

Research question five asked: What factors does the lecturer envisage will impact on any future engagement with TEL?

How lecturers perceived their engagement with TEL for the future, reported a positive position. Sixty-seven percent (*n*=152) of all lecturers felt confident in relation to their future engagement with TEL; 73% (*n*=166) were also full of enthusiasm. What is significant is that 87% (*n*=198) are ready to embrace any future changes; this is of interest as the web technologies found to be predominately employed in this research study, were not aligned to those utilised by learners; for example, social media, mobile technologies and other technologies where communication strategies employed are learner-centred. These same technologies are a strong feature of what is aptly named mHealth (mobile health), an increasing adjunct to healthcare delivery processes, which requires participation by the healthcare providers of the future. Faculty staff need to align their use of technologies to mirror the current thinking and engagement of learners and healthcare practitioners, thus faculty support is needed to capture the enthusiasm, and embrace these technological changes.

Thirty-four percent (*n*=76) of lecturers identified that a lack of staff development would prevent them from engaging with TEL in the future, which given that a significant number of lecturers are enthusiastic to engage, reflects a pro-active need for health science faculties to provide effective staff development; a

recommendation which was made back in 2011 by the HEFCE. Regardless of the need for staff development, 77% of lecturers (*n*=175) felt strongly that online learning does enhance student learning; interpretation of the word 'enhance' however was undefined, but presumed to be positive.

With these results the future of TEL, within health science faculties in the UK, is looking positive. With an investment of time, enabling staff to learn how to use web technologies, this positive outcome can be fostered, as Aldunate and Nussbaum (2013) concur, lecturer beliefs and readiness, positively influence the integration of technology.

6.1.5: Motivation to engage

The sixth research question asked: What values does the lecturer perceive to be of importance in relation to their employment, does this have a relationship on their motivation to engage with TEL?

Success and satisfaction in the delivery of education are important factors for personal job satisfaction (Canrinus et al., 2012). Establishing if there was a relationship between job satisfaction and the lecturers' engagement with TEL was therefore considered important, particularly as there is sparse research exploring the two factors which constitute Herzberg's theory of work motivation in the area of TEL. Mark and Smith (2012) reported low job satisfaction in university employees in comparison with members of the general public, and subsequently reported that academics willingly study other groups, yet seldom study themselves. The study by Mark and Smith (2012), does not however specifically relate to lecturers who are engaged with TEL.

In this study, few statistically significant findings relating to employee investment values, as they impacted on the lecturers' engagement with TEL, were reported. Of those that did reveal significance, the numbers involved were small and therefore not representative of the population of lecturers within health science faculties in general. The findings were nevertheless of interest because they confirmed that lecturers were not dissatisfied with the extrinsic factors (hygiene factors) within their work environment; hygiene factors include work conditions, salary, status, security, policy, and supervision. The results also confirmed that lecturers were motivated through the intrinsic factors which constitute their role,

for example: achievement; recognition for achievement; the work itself; responsibility; and growth or advancement.

With these results it would appear that staff are being supported and their needs on the whole are being met. Mansvelt, et al. (2009) agree, stating that in order to maximise the potential of eLearning, academic staff need to be supported and valued.

6.1.6: Do learning styles matter?

Research question seven asked: How does the learning style of the lecturer influence engagement with TEL? Learning styles in general attract much attention, particularly in relation to student learning, where their validity and reliability, and use, is relentlessly questioned (Martin, 2010; Pashler, McDaniel, Rohrer, & Bjork, 2009). Felder and Soloman developed the Index of Learning Styles in 1991, which at the onset initially included five dimensions. Felder subsequently recommended that the last dimension, 'Inductive/Deductive', was removed in favour of promoting more interactive, student-centred collaborative teaching and learning opportunities, rather than giving a choice between this and teacher-centred teaching (1998).

The learners' preference profile provided insight into how teaching strategies could be modified to address the majority profile of the student population (Zywno, 2003). The learning style of lecturers was considered to be worthy of exploration, particularly in the context of their engagement with TEL; if a specific style was dominant, it could predicate engagement. If one particular style was isolated, it could also have been used to determine future selection of academics, as recommended by the HEFCE (2011).

From the reported results, 40% of lecturers (*n*=90) had a balanced style across all four dimensions. A balanced style across all four dimensions is considered to be desirable (Filippidis & Tsoukalas, 2009), and whilst not determining engagement with TEL, may be of interest to a wider audience. The predictive validity of the learning style measures cannot therefore be used to predict the potential of new employee engagement with TEL.

The key to understanding the reported result is to distinguish learning style from learning strategy. Learning style relates to the way a person has, over time and because of experience, adapted to a particular approach to learning. In essence this means that the lecturers' style, is the style through which each lecturer concentrates on, processes, absorbs, and retains new and difficult information. Although no literature could be found relating to lecturers' learning styles and engagement with technologies, the findings are consistent with Saeed et al's. (2009) study of students' learning styles and technology preferences, where the majority appeared to a balanced style across all four dimensions.

Learning styles are interesting, and whilst the majority of lecturers displayed a balanced style, there were moderate and strong preferences reported across the active, intuitive, visual and global dimensions. To summarise the work of Felder and Soloman (Felder & Silverman, 1998), as it relates to the findings in this study, active learners prefer to learn in groups and try out new material immediately. Intuitive learners, tend to migrate towards professions such as maths and physics; they like innovation. Visual and global learners learn by viewing embedded pictures, animations and movies, professions favoured by visual learners include artists and architects. Global learners prefer to get the big picture first.

6.2: Research Contribution

Whilst the study has limitations (Section 6.3), there are a number of unique contributions to the field of TEL within Higher Education.

This study makes three unique contributions:

1. **Contribution to understanding lecturer engagement with TEL**

The determination of which factors predict engagement with TEL is critical to understanding lecturer engagement, and for developing solutions to increase engagement in health related higher education. The survey instrument highlighted that, for many lecturers, the use of computers and VLEs provoked uncomfortable feelings prior to use. Which would suggest that a baseline benchmark that determines the nature of engagement would help to improve engagement with TEL.

The results suggest, for those lecturers whose preference for face to face teaching approach was enquiry based learning, that this has an influence on their engagement with TEL and the adoption of new technologies. Therefore, encouraging those lecturers who exhibit strong, positive relationships, to mentor others, could in turn improve the levels of use in others, and, serve to promote and encourage peer interest.

The research findings are important for HEIs to consider in order to provide support and guidance to academics who are willing and eager to embrace change. One way of doing this is by utilising key questions from the survey instrument to evaluate benchmarks for staff development. This tool would be invaluable for faculty to plan for the preparation of professional development activities which promote lecturers' engagement with TEL. Moreover, self-assessment by academics, utilising sections from the survey tool to identify personal strengths and areas where action is required, would serve to provide guidance for the development of personal objectives in readiness for professional development planning, which may promote alternative forms of scholarly practice.

2. **Contribution to theory by the development of a conceptual model which identifies dynamic relationships and associated factors which underpin lecturers' engagement with TEL**

The conceptual model developed in this study may be used as a guide for further development over time to rigorously test relationships and associations which establish the dynamic nature of lecturers' engagement with TEL. Such a model would be invaluable for the planning of future research studies to discover new trends, for example in the rate of adoption of computer use.

3. **Contribution of the survey instrument to higher education and policy drivers**

The research findings are important for national policy drivers, for example the Higher Education Academy (HEA), to consider in relation to providing support and guidance for academics, and evidence of the adoption of innovative teaching and learning strategies which demonstrate excellence in teaching. The HEA works closely with HEIs to identify key strategic issues in learning and teaching, one of which is enhancing teaching quality in higher education. Recently

published, the Framework for Flexible Learning in Higher Education, provides support to institutions by focusing on the learner (HEA, 2015). Limited attention however, is given to academics and their engagement with flexible learning. The survey instrument, in particular the areas of engagement with TEL, and support systems within local environments, could be usefully employed as a step towards validating the national picture relating to growth, change and development in the area of technology enhanced learning.

These contributions will be summarised within the implications for practice in Section 6.4.

6.3: Limitations of the Study

The final analysis was based on 227 lecturers from 49 health science education providers in the UK, all of whom were presumed to have an interest in technology enhanced learning. TEL in the context of this study was defined as the enhancement of existing and new learning and teaching through the utilisation of one or more technologies (HEFCE, 2009). How enhancement is measured however, according to Kirkwood and Price (2014), is open to debate, especially when definitions offered are diverse, implying through the use of the term 'enhancement' that something needs to be improved. TEL nevertheless is extensively used throughout education, although the terms eLearning or online learning, considered by some to be too narrow for the variety of technologies used, appear to be used interchangeably (HEFCE, 2009).

The definition given in this study may have been somewhat open to interpretation by respondents, and thus a limitation of the study, particularly when considering the range of learning technologies available: i.e. from using a browser, to undertaking a literature search; from employing word processing skills to using email; from working with instructional technologies such as VLEs; through to developing fully online/blended academic courses and modules. Lecturers may have perceived TEL as face to face teaching enhanced by technologies, for example when considering web technologies for instructional preparation i.e. videos or photographs in PowerPoint presentations. UCISA offer a more robust definition, in use since 2008, which leaves little doubt as to what constitutes TEL, this may have been more usefully employed in this research study.

> '*Any online facility or system that directly supports learning and teaching. This may include a formal VLE, an institutional intranet that has a learning and teaching component, a system that has been developed in house or a particular suite of specific individual tools'* (Walker et al., 2014, p. 4).

Non-responding universities, 25 out of 74 contacted, also contributed to the study's limitation, in that bias of outcomes may have resulted due to the characteristics of non-responders differing from those that did respond. Furthermore, the majority of lecturers taking part in the study were lecturers in nursing, and whilst all professions allied to health were invited to take part in the study, the findings from both of these limitations may not be generalisable to all health science lecturers.

6.3.1: Data analysis limitations

Powerful analysis can be undertaken using parametric data analysis, for data that is nominal or ordinal, then nonparametric testing should be used (Bettany-Saltikov & Whittaker, 2014). Following a purist nonparametric approach, whilst used appropriately in this study, is not without its critics. Norman (2010) reports that 75% of research undertaken on education, health status and quality of life assessment, can effectively be 'trashed' due to the researchers' use of parametric testing on inappropriately defined interval/ratio data, collected using Likert scales. To strengthen the findings it may have been more appropriate to employ detailed levels of measurement, enabling appropriate means and standard deviations for all questions, and then employ parametric statistical analysis on correctly designed interval/ratio data collection methods, as recommended by Jamieson (2004). The lecturers' interpretation of their engagement with TEL, compounded by the nature of cross-sectional correlational surveys, could have confounded the results of this study. Tighter definition, and more powerful data analysis, could, if addressed in future research strengthen the findings.

6.3.1.1: Factor removal

Table 6.3, on the next page, reports four items (factors) from the pilot study questionnaire, which could have been removed to improve reliability in the main study. None were considered dramatic enough to alter the degree of reliability, although keeping them in could have contributed to the limitations of the study. If removed, then a factor analysis would be needed in order to check that the

structure of the items in the subscales had not been affected in any way (Field, 2009). The pilot study's main purpose was to test the acceptability and usability of items in the questionnaire, and although reliability was acceptable for all subscales, a more in-depth exploration of the items within each subscale may have highlighted this level of detail. If, after piloting, this detail had been addressed, amendments could have been made to the design and content of the survey instrument used in the main study.

Table 6.3: Item removal to increase reliability

Question	Item	*α*	*α* after removal
3.2: Computer skill	*'I believe that working with computers makes a person more productive at his/her job'*	0.65	0.76
5.1: Anticipated consequences of use	*'Working with a computer would make me very nervous'*	0.89	0.93
5.2: Utilisation	*'I feel confident providing hyperlinks into emails*'	0.81	0.85
6.1: Lecturer Support:	*'I feel that other staff depend on me'*	0.86	0.88
- connectedness		0.68	0.80

6.3.1.2: Factor analysis

The main study analysis drew attention to reliability, specifically where item (factor) removal, as noted above, could have been applied. The scales used in the questionnaire, which had been employed from existing surveys had, for the most part, included factor analysis. Having taken for granted the factor analysis employed by the researchers in their work, and without realising the potential of factor analysis, data from the pilot study stage could have been explored for extraneous items (factors) included in the subscales. If necessary they could have been removed prior to the main study in order to strengthen the findings. Factor analysis would have been useful to report, as in the case of some of the scale items employed, the target audience had been amended from student/learner to lecturer, which could have affected the validity and reliability. Validity and reliability had previously been assured in the survey items from Barbeite and Weiss, (2004); Joo et al. (2000), and Pajo and Wallace, (2001).

A retrospective exploratory factor analysis was conducted on data from Section Five of the main study survey instrument which included the four subscales:

1. Anticipated consequences of use;
2. Utilisation;
3. Impact; and
4. Task-technology fit.

The factor analysis was performed to see which of the items (factors) 'would go together best', as described by Yong and Pearce (2013). Section Five had large datasets consisting of several items, which through factor analysis could, if used in future research, be reduced to a smaller set to facilitate interpretation, strengthen validity and reliability, and reduce limitations.

Table 6.4 reports the principal component analysis Varimax rotation, revealing six iterations converged from the Section Five matrix. The convergence included 23 items variables, which in the pilot and main study had included 31 variables. Performing a scree test, revealed an 'elbow at 7' (Figure 6.1), calling for the retention of six factors as shown with their associated variables in Table 6.5.

Table 6.4: Six factors extracted with an Eigenvalue greater than one

Component	Eigenvalue	% of Variance	Cumulative %
1	7.889	18.523	18.523
2	4.287	12.069	30.591
3	3.192	11.036	41.628
4	1.890	10.315	51.942
5	1.730	7.941	59.883
6	1.193	5.218	65.100

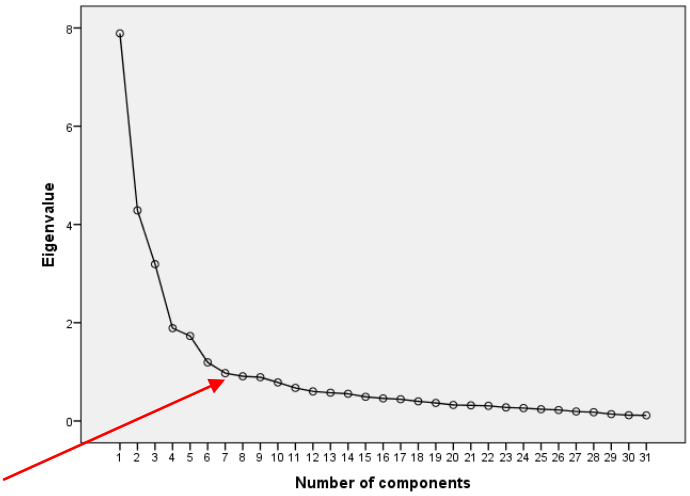


Figure 6.1: Scree plot for principal component analysis of scores with a six-factor solution specified

The six subscales identified a slightly different configuration from those employed in the pilot and main study, but importantly, apart from 'Impact 3' where lower reliability is reported (α=0.63), would not have greatly affected overall reliability. Validity however, is confirmed through the performance of confirmatory factor analysis, which as can be seen in Table 6.5 on the next page, resulted in a slightly different underlying structure for Section Five. Naming of new subscales, for the most part, could mirror those used in the study; the three discrete areas relating to 'Impact' would, if used in future research, need to be renamed to reflect the items within them more appropriately and further reduce potential limitations.

Table 6.5: The twenty-three items within the six-factors

Task-Technology Fit [VLE] ***α*=0.79**	**Utilisation** ***α*=0.80**	**Impact 1** ***α*=0.79**	**Anticipated Consequences of Use** ***α*=0.89**	**Impact 2** ***α*=0.78**	**Impact 3** ***α*=0.63**
Is user friendly	Using search engines	Lack of staff support	Make me feel uneasy	Lack of enthusiasm	Factor of time
Is easy to use	Connecting to the homepage	Organisational structure	Make me feel uncomfortable	Don't want to change	Lack of confidence
Does what I want it to do	Downloading and saving files	Lack of staff development	I get a sinking feeling		
It's easy to become skilful	Find previous pages and using the back button	Technical problems: unreliable network			
Fits well with the way I work					
Is compatible with my work					
Easy for students to understand					
New features are easy to learn					

6.3.2: Research design limitations

A cross-sectional correlational design was used, producing data which represents one point in time, this in itself provides evidence for recommendations of change for the future, but does not test for causal relationships, the findings and correlations therefore need to be interpreted with caution. Participants' responses were presumed to be self-reported via targeted email/survey links, it is also assumed that all participants gave honest responses.

Whilst the adoption of a positivistic approach to the research design has been illuminating, strengthening the findings through the inclusion of a qualitative dimension may have revealed more focused in-depth data addressing context specific localised practice, for example through case-study analysis. Case-study research can be used to look at individuals, a small group of participants, or a group as a whole (Lewis, 2015), using direct observations, interviews, protocols, tests, examination of records, and collections of writing (Yin, 2013) in a specific

context. Exploring the findings from this study through more detailed description could have included:

- Local provider policy; workload allocation, professional development. This study revealed that half of the lecturers who were fully engaged with TEL, were being asked to provide peer support to others. Therefore, what support mechanisms are available for competence development? What value is placed on workload allocation in relation to professional development? Localised case-study analysis could, with approval, evaluate local policy to determine what support mechanisms are in place, and, verify patterns of workload allocation to ascertain professional development activity for lecturers.
- Exploration of how academics use a VLE; this study implies that lecturers who were fully engaged with TEL, had the confidence to maintain and fully utilise the features of a VLE, so much so that their students found navigation and engagement easy. Is this the reality? When considering the age range of students (see the next bullet point), across full and part time programmes of study, it would be useful to measure, along with age, how the VLE supports their learning; questions similar to those utilised in this study could be adapted for this purpose.
- Age range of students; current literature has not explored contemporary age ranges of students undertaking health related programmes of study in the UK. An exploratory study may provide evidence to either support or disclaim the so called digital divide. A study similar in approach to those undertaken annually by the EDUCAUSE Centre for Applied Research (ECAR) (Smith & Caruso, 2010), which, since 2004, has collected quantitative data from undergraduate students in relation to their adoption of technology (using Rogers (2003) classification, as in this study). Including all students undertaking health related programmes of study, quantifying age, and adoption of technology, could then provide evidence of the reality in relation to the age range of student cohorts within health related disciplines.

The limitations discussed for this study should be considered for future research in order to increase the generalisability of the findings.

6.4: Implications

There are a number of potential implications for theory, policy, future HEI and professional bodies TEL training and support.

Implications for Theory

On the topic of theoretical implications of this study's findings, it is important to highlight the increasing proliferation of research adding to the knowledge base underpinning TEL. Contributions continue to reflect the adding interest and uptake in this rapidly changing area within higher education. The findings of this research also inform existing and future theories and models dealing with lecturers' engagement with TEL. The findings of the significant variables computer skills, computer exposure and preference of face to face teaching stress the importance between lecturers and faculty for successful engagement with TEL.

Whilst no statistically significant relationships were found between the four learning style dimensions and the lecturers' engagement with TEL, the question that remains unanswered is 'how can HEIs ensure that academics are supported in relation to building on their motivation and enthusiasm to engage with TEL?' There is a reported need to provide support to lecturers in the provision of TEL which, as highlighted in this research study, needs to stimulate all four learning style dimensions. A proposed model for delivery, which raises several key points, may be effective for the transferability of learning innovation, and might well be a useful starting point for localised professional development teams to consider.

Figure 6.2, on the next page, illustrates how new information relating to web technologies can be delivered to lecturers. Approaches highlighted within the outer perimeter boxes depict how the balanced learning dimensions within the segmented circle, can be integrated to provide an optimal learning environment.

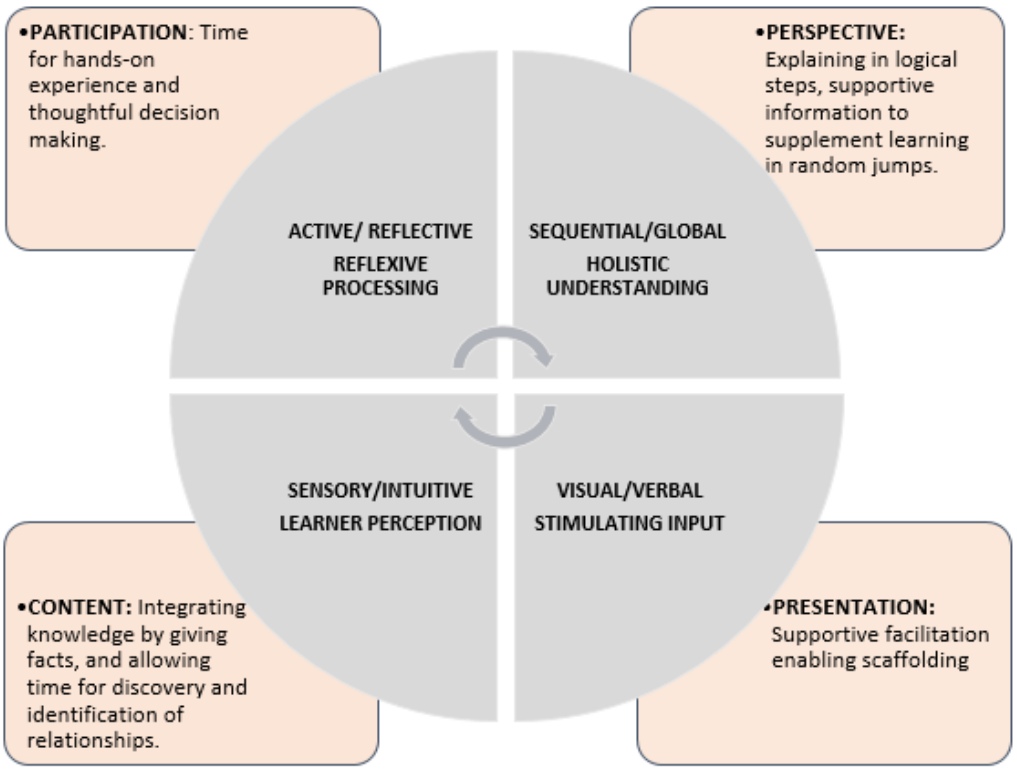


Figure 6.2: Adaptation of Felder and Silverman's (1998) Model of Learning and Teaching (p. 675)

Learning style of the lecturer in relation to engagement with TEL, may therefore inform research and theories about the delivery of professional development activities being balanced across all four learning styles. Whilst the learning style of the lecturer did not influence engagement with TEL, the learning styles questionnaire did validate the lecturers' learning style. As a discrete questionnaire, its use is evident in relation to determining approaches to professional development activity.

Furthermore, although lecturers' job satisfaction, in relation to intrinsic and extrinsic factors within the work environment and their role, revealed no significant findings, there was evidence of conflict reported in relation to the creation of psychological stress when using computers. This may promote further research as it relates to lecturers' engagement with TEL.

Implications for Policy

The findings of this study may have implications for the review of existing policy or the development of policy for the management of academics' workload and professional development relating to the implementation of TEL at university and faculty level. This study points out that lack of time to learn about new technologies, and their applied use, continues to be raised as an issue by lecturers. The complex relationships involved with TEL are often insufficiently understood, with little or no supporting evidence within policy statements and institutional strategy documents, according to Kirkwood (2009).

For universities, the first step recommended is to identify the factors and issues that can help predict lecturer success in their engagement with TEL. This study's findings highlighted that years of service, does not attribute to the lecturer's computer skills and computer exposure. Conversely, computer exposure i.e. the web technologies used, is attributed to preference of face to face teaching style, likewise, computer skill has a strong relationship to engagement with TEL. These significant factors contribute to the success of lecturers' engagement with TEL, implying that faculty should look into their existing policies involving staff development, academic requirements and faculty interaction. Policy modifications that support lecturers to succeed in their professional development of TEL activities may be needed, especially, as in this study a significant number of lecturers were enthusiastic to engage, but lacked staff development. Addressing academics professional development should be done by utilising a revised version of the survey instrument developed for use in this study, as a benchmark for subsequent developmental activity. Establishing personal benchmarks for the adoption of innovation and the use of new technologies, may also serve as a positive driver; as seen in this study's findings there is a positive correlation between the use of web technologies, and adoption of innovation, both of which are associated to an increase in lecturers' confidence.

Implications for Faculty

This research makes a contribution to policy makers to support the embedding of TEL in learning and teaching faculty policy.

Professional development activity

Education innovation in the workplace cannot take place without competent academics. Technical competence is seen as critical in 21st Century teaching (Gregory & Lodge, 2015), academic staff will want or need to be up-skilled in some form of TEL. As this study reveals, no simple relationship emerges between content and technology, sometimes new content-related ideas emerge, at other times new technologies emerge, both nonetheless need to be evaluated as part of the academic's professional development. This study highlights that lecturers are confident and motivated to engage with TEL, the benefit to student learning is also recognised. It appears to be obvious that academic staff are key, and yet competence is not aligned to the dynamics of technology advancement and professional development. Stein, Shephard, and Harris (2011) suggest that the reason eLearning has not been fully embraced is because of the lack of appropriate professional development.

By addressing professional development needs, support can be determined to enable lecturers to achieve more. Increasing commitment by higher education investment and increasing the value placed on TEL are areas for recognition within policy development. For example, emerging scholarly practices utilising technology should be aligned to faculty and university policy. Lecturers dedicating time to the development and implementation of pedagogically sound, quality TEL practices, recognised as evidence of academic scholarship.

The post-graduate certificate in education (PgCE) HE programme, as advocated by Mayes et al., (2009), needs to explore pedagogical practice, in order to reflect fresh learning initiatives. Technological approaches need to be aligned with flexible pedagogical themes, which Ryan and Tilbury (2013) stress should also be continued within institutional continuing professional development (CPD) for academic staff. Some universities have provided investment in TEL within their localised PgCE programmes for new staff, but UK wide, TEL appears to be included on an ad-hoc basis. Academics are a core and integral part of the teaching-learning process and they need support and encouragement as well as new knowledge, skills and abilities to be able to integrate eLearning into their teaching on an ongoing basis. It is of importance to ensure that TEL, either as an approach for enhanced engagement (Gregory & Lodge, 2015), flexible learning

(Hack, 2015), long distance collaboration (Beaven et al., 2013), asynchronous and/or synchronous communication (Strang, 2012), or as a means of offering additional support (Kim & Hannafin, 2011), is employed as an enhancement to student learning, and as such becomes a standard for teaching, rather than an adjunct to the learning experience as reported by Bond and Goodchild (2013). As Salmon (2011) concurs, the investment in TEL, by academic institutions, is sporadic in the UK, ranging from incremental integration of learning technologies as part of CPD, with recognition and reward attributed to individuals through staff promotion schemes, through to the appointment of profession specific (departmental/faculty) lecturers in eLearning.

Healthcare education delivery

In order to understand the advancement of technology use within the healthcare clinical context, faculty should also implement policies that encourage working with health partners in practice. The utilisation of technology in teaching should be aligned to the technologies utilised in health care delivery, this integration would allow practising health professionals and lecturers to usefully mirror current thinking and explore technologies in relationship to subject matter, in authentic contexts.

The vision for TEL across health and social care is grounded is six key principles that should underpin world-class education (DH, 2011, p. 18).

1. Be patient-centred and service driven – *technological applications must focus on equipping the workforce with the necessary skills for safe and effective patient care,*
2. Be educationally coherent – *any technological application should address clearly articulated learning needs that are aligned to service needs,*
3. Be innovative and evidence-based – *applications should enhance training, be informed by the best available evidence, and where possible be future-proof by being flexible and adaptive so minimising redundancy,*
4. Deliver high quality educational outcomes – *meets and, wherever possible, exceeds agreed standards,*
5. Deliver value for money – *technological applications should enhance training, improve productivity, reduce duplication and be affordable and cost effective,*

6. Ensure equity of access and quality of provision – *applies across the health and social care workforce.*

Health Education England (HEE) is to work in collaboration with higher education institutions to implement its strategy and ensure that TEL; including simulation, eLearning and the use of mobile applications, become commonplace in curricula and in CPD (DH, 2011).

Lecturers employed within health science faculties have a vested interest therefore to embrace new technologies and refine existing approaches in order to mirror the technological challenges that health care professionals are being exposed to in the provision of safe and effective care. One of the guiding principles of HEE is to ensure high quality staff development to ensure the effective and efficient adoption of TEL; higher education faculties will provide the support to enable the better use of technology (DH, 2011).

Implications for Professional Bodies

The findings from this research, although not generalisable, have highlighted that institutional standing and academic discipline do not appear to affect the lecturers' engagement with TEL, with lecturers reporting keenness and motivation to engage in the future. Encouraging innovation is therefore recommended as a measure to ensure quality learning and teaching is valued on the same level as research. The Research Excellence Framework (REF) assesses the quality of research, currently no equivalent exists for the quality of teaching (Cabral & Huet, 2015). The government's Green Paper proposal for a Teaching Excellence Framework (TEF), published in November 2015, aims to address the imbalance between research and teaching by recognising and rewarding high quality teaching (Department for Business, Innovation and Skills, 2015). The TEF aims to highlight exemplary practices where teaching has equal status to research, and outstanding teachers are rewarded with the same recognition and opportunities as researchers. Drivers of teaching excellence are not currently proposed, nor is the final design of the TEF, but this study would recommend an investment in the promotion of education delivery which facilitates the acquisition of 21st Century digital skills. The metrics, or measures of teaching excellence currently proposed, focus on three areas: employment/graduate destination;

retention; and student satisfaction. Future metrics, to be considered in a technical consultation, should not lose sight of the impact of technological advancement on the delivery of teaching and learning, and as reported in this study, lecturers' increased adoption of new technologies into their teaching practices. Excellent teaching, as reported in the response to the TEF, by the HEA (2016), is not a destination but a dynamic and developmental process.

6.5: Summary

What comes first, the challenges associated with the lecturer's engagement with TEL, or the lack of strategic and operational policy for the introduction and ongoing support of lecturers engaged with TEL? These are question that need to be primarily addressed, and answered, by further research, faculty hierarchy and policy makers, and professional bodies, otherwise the status quo ubiquitously found in published literature will continue to reinforce the dichotomies of time, professional development, and support systems as highlighted in this research study.

6.6: Recommendations for Future Research

The overall results of this study validate and add to previous research that engagement with TEL is directly related to three key areas:

1) Dedicated time to allow lecturers the opportunity to learn more about digital technologies and creative pedagogies;
2) Professional development and support to enable the successful transition from face to face teaching to an online environment; and
3) Finally, recognition of lecturers' keenness and motivation to engage with TEL.

Based on the analysis of the data and results presented, the following research recommendations are offered for consideration. Although this study revealed some promising data, additional studies could build on the results and provide a greater wealth of knowledge in this area. In summary this study recommends ongoing research in the following key areas: -

Development and ongoing testing of the survey instrument used in this study, as a guide for lecturers, faculty, universities and professional bodies to plan professional development and scholarship activities.

The adoption of a mixed-method research study design, perhaps including case study analysis, where the impact of local policy on lecturers' integration of TEL into their teaching practices can be rigorously evaluated within a local context as well as fully describing the measures currently provided.

At present the TEF is in its early stages of development, this study was conducted to explore lecturers' engagement with technology enhanced learning. Since the research underpinning the development of the TEF is non-existent, additional research involving lecturers at the competitive edge of education delivery over a wider demographic and geographic areas is called for. For example, in light of the TEF proposals, and in recognition of lecturers' keenness and motivation to engage with TEL, what measures are HEIs taking to successfully implement strategies for teaching excellence? How can policy makers empower lecturers to benchmark their online teaching practices?

Final thoughts

Although the provision of focused staff training on the development, use and benefits of web technologies is encouraged, this needs to be on a regular basis but more importantly, needs to be provided and continually supported by in-house professional development personnel. Having hands on dedicated support is seen as being beneficial in the long term; from personal experience, once lecturers achieve skills and confidence using web technologies they are keen to promote their usage as well as share the skills they have achieved.

Years of experience in higher education as well as years of teaching in higher education can influence the use of technology, but in this study engagement with TEL is across an age spectrum. The key is to provide peer to peer mentorship by engaging those academics, who are embracing and using web 2.0 technologies in their online teaching and learning, to work with colleagues who are less experienced and less confident. Support and encouragement are then fostered and gradually cascaded to others. Using experienced peers productively however,

requires careful management, so as not to promote over-reliance on a few key members of staff.

Chapter 7 - REFLECTIONS: LOOKING BACK, THINKING FORWARD

This final chapter presents my own personal reflection on the learning journey leading up to the submission of this thesis, including why a Professional Doctorate training route was chosen over the more traditional Doctor of Philosophy (PhD) training, and reference to the high and low points faced on the journey. The process of reflection will be structured around the three key themes highlighted by Boud, Keogh and Walker (1985), namely: returning to the experience; attending to (or connecting with) feelings, and evaluation of the experience. The final reflection, now that I have completed my study, will include what, with hindsight, I would do differently, and the possibilities for the future in relation to research, professional development, and ongoing opportunities.

7.1: Returning to the experience …

Commencing Professional Doctorate training was not a light decision to make, particularly as I was employed at one university and would be studying with another local university. The choice was ultimately made to reflect my own professional practice background. For the majority of my career, nursing in perioperative practice has been my area of expertise. Following senior clinical roles in perioperative practice, my first role in higher education was as a clinical nurse teacher in operating department practice. The role evolved and eventually I developed, along with an enthusiastic team, the first combined (nurses and operating department practitioners) BSc (Hons) in Perioperative practice programme in the UK, for which I was programme leader. Quite by chance, in 2002, I was given the opportunity to 'attend' the first online moderating course, led by Professor Gilly Salmon. Best known for her contributions to online education, research, innovation and the use of technologies, Professor Salmon is now Pro Vice-Chancellor (Education Innovation), at the University of Western Australia. The course was designed to replicate the typical activities that a lecturer (described as the e-moderator) delivering online learning and teaching, might be involved in, and was framed around five key areas: access and motivation; online socialisation; information exchange; knowledge construction;

and development. After successfully completing this course I felt encouraged to 'experiment' a little in producing online materials.

Personal circumstances latterly brought me to the south coast where my role was to deliver post qualifying CPD courses in anaesthetics, operating department nursing practice, post anaesthesia care and day surgery/ambulatory care. My interest in technology enhanced learning enabled me to experiment, learn about, and then utilise various software tools, which led to the development of a blended module for anaesthetics and post anaesthesia care; part delivered face to face, part delivered online. My colleagues were taking notice, and gradually saw the potential of using wikis as a collaborative tool for enhancing learning, and student to student interaction. Subsequently, I wrote up the experiences of engaging all pre-registration nursing students in the use of wikis, as a form of communication between learning groups and learning group tutors, this paper was also presented at the European Distance and eLearning Network (EDEN) conference in Naples, Italy (Jepson & Morgan, 2007).

Professional Development Planning, with my line manager, included an in-depth discussion focusing on my own role in relation to developing an online option for the delivery of perioperative practice modules as part of the faculty's continuing professional development (CPD) portfolio. Because of the wide geographical area associated with CPD, this option would be an added attraction for clinical managers, students and budget holders. My own professional development also raised the question of studying at doctoral level, particularly as a qualification at doctoral level, for academics working within the University of Southampton, is considered a desirable requirement for all new employees, and for those in current employment, is an essential element of career progression from lecturer to senior lecturer. To study at doctoral level however, in area which was at the root of my own professional practice, was unachievable within my own institution. Ultimately this meant that I had to consider the Professional Doctorate programme of study, delivered at the University of Portsmouth, in relation to the Doctor of Philosophy (PhD) programme delivered at the University of Southampton, and whether or not, the former would meet my own and my employer's remit for career progression.

Professional Doctorates been around since the early 1990s (Fulton, Kuit, Sanders, & Smith, 2012), and have been described as a new form of doctorate that challenges the traditional PhD (Kot & Hendel, 2012) According to Smith (2009) Professional Doctorates are:

> *".... associated with the acquisition of knowledge and research skills, to further advance or enhance professional practice" (p 6).*

The traditional PhD is generally seen as being more relevant to people who are hoping to develop careers in academic work or research (Fenge, 2009). At the University of Southampton, the faculty's key research interests focus on Cancer, Palliative and End of Life Care; Innovative and Essential Care; and Rehabilitation and Health Technologies, for me these areas of clinical practice are far removed from the professional practice of perioperative care delivery. The Professional Doctorate is for those already immersed in professional practice, which may or may not be in academic work. The ethos of the Professional Doctorate is to exam a real life issue, concerned with professional practice within your own organisation, through the embedding of research in a reflective manner (European University Association, 2007). The real life issue was an easy choice. The question originally posed was to investigate student learning by evaluating the delivery of a face to face perioperative nursing course, in comparison with the delivery of an online perioperative nursing course. The Professional Doctorate programme was, therefore, the most suitable route of training to meet my own work and personal development needs; I was keen and ready to engage with the training offered. Study leave was granted, and at the onset of the programme, partial financial support was secured.

The Professional Doctorate programme delivered at the University of Portsmouth comprises two stages, stage 1 is the achievement of 180 level 7 credits (completed before enrolling to the course). Stage 2 consists of two parts: Part 1, includes taught and assessed units of study comprising, a professional review and development unit, advanced research techniques, publication and dissemination unit, and the professional research and development proposal. Part 2 is the self-determined research study supported by academic supervisors.

The ‘Publication and Dissemination’ unit became the catalyst to publish my work, in the Journal of Children’s and Young People’s Nursing, relating to undergraduate child branch nursing students using wikis as a collaborative tool in enquiry based learning (Jepson, 2008). All undergraduate learning group tutors in the faculty of health science had been required to engage with wikis, and whilst some were reticent, others were keen to embrace this approach. The focus for my research study, which initially had been to conduct evaluative research relating to the delivery of face to face and online perioperative learning modules in anaesthetics, operating department nursing practice, and post anaesthesia care, had been removed due to the CPD contract being streamlined to mirror the faculty research themes. At the conjecture of the taught element of the programme drawing to completion, a new research question was identified for the research study: namely ‘What are the perceived barriers and enablers impacting on lecturers’ engagement with TEL; why do some lecturers engage, and others do not?

As my engagement with TEL increased, my responsibility increased to reflect this growing focus, eventually accounting for 0.8 of a whole time equivalent role, which included the management of the faculty TEL budget. The role has had many challenges, one of which has been to support and encourage academic staff to engage with technology enhanced and learning and take responsibility for developing online learning materials. The materials produced have been encouraging; with some academics, who had previously shied away from technology enhanced learning, producing their own online modules, and now being able to maintain them independently. The work produced has been of high quality and has resulted in the following modules being designed, developed and evaluated successfully.

- MSc Research for Evidence Based Practice (multi-disciplinary; delivered fully online or via a blended learning approach)
- MSc Dissertation (multi-disciplinary; delivered fully online)
- MSc Open Learning (multi-disciplinary; delivered fully online)
- BSc Work Based Learning (multi-disciplinary; delivered fully online)
- BSc Assessing Learning in Practice Situations (ALPS); Mentorship (multi-disciplinary; delivered fully online or via a blended learning approach, or via face to face delivery)

What is significant from this, is that apart from the online moderators' course, I have had no previous formal training or attended any professional development programme relating to TEL. My interest has stemmed from trying to involve students in more interesting and creative ways, enabling them to engage with the learning outcomes of their course or module whilst studying at a time that is conducive to them in an environment of their choice. The challenge of producing innovative and unique online resources is something that I thoroughly enjoy, and in doing so, I have always tried to encourage and enable my peers to do the same. In some instances there has been a reluctance to engage with TEL despite support and encouragement. This led me to consider why this might be the case, especially as within my own faculty, academic staff received dedicated support from an academic who is there to guide, 'hold hands' and provide one-to-one support.

In 2014 I was nominated for the Education and Training Innovation Champion of the Year, and received a 'Shine Award' from NHS Health Education Wessex. I have also designed, and developed with my peers, many online resources including an interactive Health Sciences Careers Resource; Learning Disabilities interactive resource; and an Autism Learning Resource. The online autism resource was recently chosen as a finalist for the 2015 Autism Professionals Awards, in the category:

'Award for Inspirational Education Provision' which can be viewed at the following URL: http://www.autismprofessionalsawards.org.uk/finalists.html

In July 2015, I received, with immense pride, the Vice-Chancellor's teaching award, for my outstanding contribution to education at the University of Southampton.

7.2: Attending to feelings …

7.2.1: Challenges encountered during the research study

There were many challenges throughout the programme, the most demanding happened at the point of progression from Part 1 to Part 2 when my proposed research proposal was peer reviewed by two members of academic staff at the School of Health Sciences and Social Work. My application for ethical approval,

along with the steep learning curve relating to the collection and commencement of data analysis for both the pilot and main study, were also areas where I encountered difficulties.

7.2.1.1: Progression from Part 1 to Part 2

Progression from Part 1 to Part 2 was not without its problems, and there was no doubt that the option of quitting the programme was seriously considered at this point. My research proposal was submitted in July 2011, and in August 2011 I received correspondence which highlighted that my study was interesting and timely, but there were a number of limitations which needed clarity before a final recommendation could be reached. I was asked to address the limitations, resubmit the proposal, and attend a formal meeting to discuss the points addressed with the two independent assessors. Prior to the meeting I met with my academic supervisors and worked through each of the points raised, shared the revised proposal with them and then re-submitted to the assessors. The formal meeting took place in October 2011. This meeting was personally very difficult and upsetting, throughout the discussion I felt disheartened, inadequate, and unworthy of studying at doctoral level. The depth of discussion was a painful lesson which taught me to defend my decisions with carefully worded clearly expressed argument. On reflection, the meeting enabled me to explain the rationale for the theoretical and conceptual frameworks, and the research method to be employed.

Progression to Stage 2 Part 2 was recommended, although a number of points were noted for consideration, which the assessors strongly recommended I addressed before continuing with the project, these included, but were not limited to:

1. Widening participation from eight universities to include all UK universities.
2. Recruitment to the study needed to be clearer.
3. Consider removing the Eysenck Personality Questionnaire.
4. Clearer functionality of the pilot study

The points raised made perfect sense, and were all acknowledged, in the research proposal amendments. The recruitment strategy was determined in full,

prior to the submission of my ethical approval application. And whilst I would have liked to have included personality measures within my data collection tool, I understood the sensitivity nature of some of the questions, and how they could have a negative impact on the subsequent response rate.

On the 3 January 2012, I received notification that the university Board of Examiners had approved completion of Part 1 and progression to Part 2 of the professional doctorate programme.

7.2.1.2: Ethical approval

Compiling the paperwork for the application for ethical approval took longer than anticipated. The difficulties of working full-time, managing the balance between work and home life, and supporting a teenager through 'A' levels and career aspirations was demanding, having multiple responsibilities required a constant switching from one mind-set to another (Watts, 2008). Within my working role I was also submitting ethical approval applications, in order to conduct formal evaluations of the online MSc in Research for Evidence Based practice and MSc Dissertation modules, prior to them being validated for approval to run; these applications involved student observation and focus group interviews. Figure 7.1: illustrates the reflexive approach taken, prior to the submission of my application for ethical approval to the University of Portsmouth.

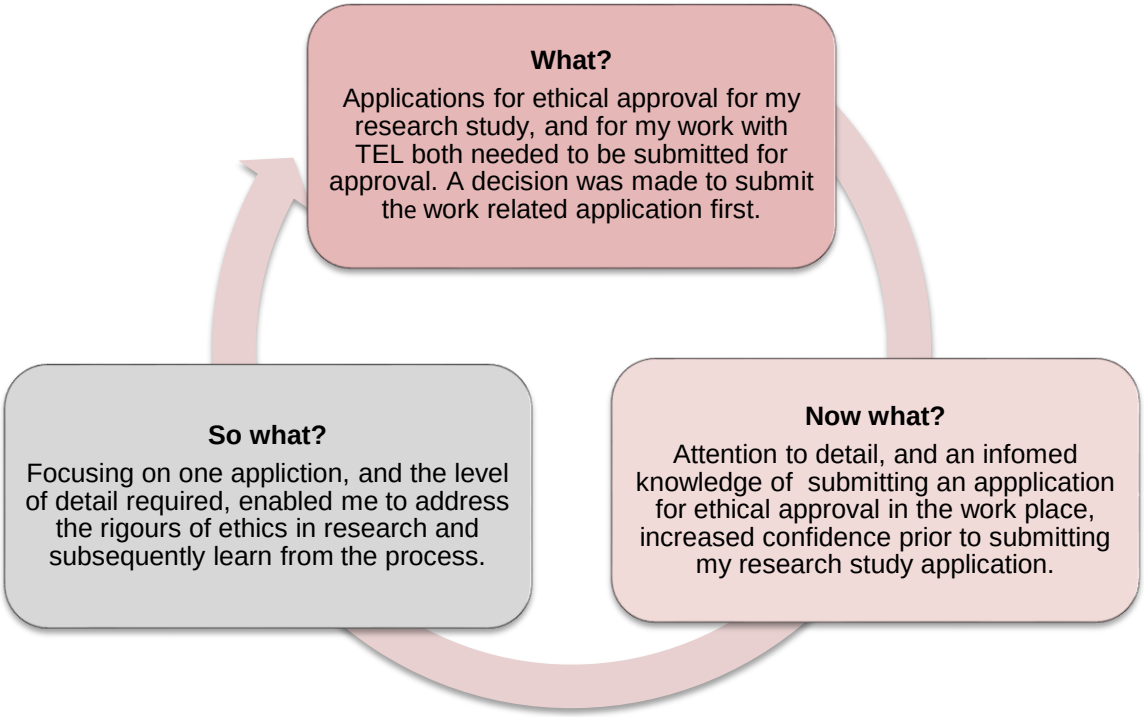


Figure 7.1: Reflexive approach taken in applying for ethical approval Adapted from Rolfe (2014, p. 489)

By carefully managing the process; submitting one application to the University of Southampton's ethics board, in order to measure, through evaluation, students' experiences of undertaking online learning modules, before the submission of the application to the ethics board at the University of Portsmouth, enabled me to learn more deeply from what I was doing. The learning process undertaken in the workplace, was informing the process required for the professional doctorate application by allowing me to change and build on my existing practices, a process echoed by Rudman (2013). The ethical application for my study was submitted in October 2012 and upon first review reached a provisional favourable opinion which was dependent on the clarification of a five minor requests:

1. In the research proposal there was reference to three reminders being sent to non-responders at four-weekly intervals; this was not reported in the ethical application. To avoid harassing people one reminder was suggested as sufficient.
2. The research proposal stated that findings would be fed-back to individual institutions. This was not clear on the information sheet. Additionally an

awareness was made to protect participants' identities if feeding back responses where only one individual had provided information.

3. The pilot study questionnaire needed to inform respondents that it was a pilot study, and needed to include information that they were also required to complete a short additional questionnaire.
4. The iSurvey mechanism needed to be set up to not send out reminders to respondents who had withdrawn from the study.
5. Clarity was needed as to how the iSurvey system anonymised names which were stored in Excel csv files.

Responses to these minor requests were submitted in November 2012 which led to a favourable opinion being given by the Science Faculty Ethics Committee on 19th December 2012. On reflection, I state that I have considered the ethical dimensions on completion of my research study, and confirm the ethical approval which was granted to me in 2012 (Appendix M).

7.2.1.3: Data collection pilot study

Data collection for the pilot study took three months; from January 2013 until March 2013. Whilst the iSurvey system reported compatibility with SPSS, on first downloading the data, I had a horrendous shock. The whole presentation of data looked like gobbledegook, with nothing vaguely familiar, and unlike anything I had previously seen. I had received SPSS training on data inputting, and analysis of complex data, both within the Professional Doctorate Advanced Research Techniques unit, and other additional workshops I had attended. Although questions posed within the survey instrument had all been transferred into the SPSS software programme, in order to make sense of this data I had to commence the laborious process of replacing the questions with numerical values. Eliminating the questions posed, although I didn't know it at the time, was enabled by simply clicking 'not adding prefix'. My limited experience with quantitative data and the iSurvey tool, still left me feeling unconvinced that I had entered data coding correctly, I therefore proceeded to manually check 'by hand' all inputted data using an Excel spread sheet, this included the numbering of variables to ensure that they "matched" with the SPSS input and output. For my own reassurance, I needed to be confident that when importing Excel csv files into the iSurvey system, and, subsequently exporting data using SPSS, that the

variables and the numerical responses for analysis were correct. I was also at a loss as to how to compute the data relating to learning styles, as the process was complex and convoluted, a point raised by Zywno (2003) in relation to the dichotomous nature of the scales in the learning style inventory which renders using standard statistical tests difficult.

This was another major low point; the second point where I felt like quitting the programme, especially when it appeared that there was no way of analysing this aspect of the data, unless manually working through it (by hand) using an Excel spreadsheet. Transferring, and computing what was ascribed on an Excel spreadsheet by hand into SPSS, was from my limited knowledge of SPSS virtually impossible, and whilst it was feasible to work out the learning style for the number of participants in the pilot study using Excel, I was concerned that the larger numbers expected for the main study would be virtually impossible to achieve. Help was eventually ascertained and through careful exploration, guided problem solving and support, and a lot of note-taking, I felt comfortable with the convoluted process which needed to be employed.

In June 2013, by some perverse twist of fate, I was involved in a road traffic incident, which resulted in a five month absence from work. I sustained three fractured ribs (left side), a dislocated left humerus, multiple fractures of the left clavicle, a Morel-Lavallée lesion to soft-tissue over my left thigh, and a 'cheese-grated' fracture to the left greater trochanter of my femur. Thankfully my right arm and hand were unscathed, I therefore decided not to suspend study, but work on manually inputting all of the data from the pilot study into Excel, and see for myself, when comparing with the output from SPSS, that I was achieving the same output data. A blessing in disguise! This was particularly gratifying as for the main study it would have been unrealistic to do this, due to the large number of variables and the additional volume of data predicted. Denscombe (2010) reinforces the disadvantages of quantitative analysis by stating:

> *'The quantitative data are only as good as the methods used to collect them and the questions that are asked. As with computers, it is a matter of 'garbage in, garbage out' (p. 264)*.'

Maximising my time off-sick, although not always pleasant, enabled me to write up the pilot study, and prepare for the commencement of the main study.

7.3: Evaluation of the experience …

The amount of learning that has taken place whilst I have undertaken this study has been immeasurable, the level and depth of work has been challenging on occasions. For me there has been a number of steep learning curves, which occasionally have led to demotivation, especially when support was hard to gain. The dichotomy of working in one university and studying at another is not for the faint-hearted; Carr, Lhussier, and Chandler (2010) recommend a practice advisor in the workplace, and although this was agreed I found it extremely difficult to ascertain any concrete support, apart from study leave.

I have learnt the importance of carefully labelling in a logical format, and the role of databases such as Mendeley™, a reference management software tool for the storage and retrieval of literature searches, and journal articles.

For me one of the most painful and steepest learning curves was working with SPSS, but with pain comes pleasure, and for the most part the data analysis has been one of the most enjoyable and rewarding aspects of undertaking this study. I now feel so much more confident in carrying out quantitative data analysis; for me this was a new approach which I pursued for personal satisfaction and professional growth. Previous research studies had focused on the qualitative approaches of grounded theory (Bachelor of Health Science degree), and phenomenology (Master of Nursing degree), and having completed the doctoral training in Part 1, I wanted to explore research design utilising a totally different approach.

I have learnt the value of goodwill, empathy and support, and have been encouraged by the support received from colleagues in other universities. Fellow academics who have participated in my study, and are also undertaking their own doctoral studies offered hints and tips, which I very much welcomed. I received responses from very senior ‘gatekeepers’ which were complementary and encouraging, and for the most part have learnt to develop and maintain excellent communication channels.

7.3.1: Doctoral research publications

One of the most rewarding experiences of the professional doctorate programme was having two academic papers accepted at the 2014 EDULEARN 6th International Conference on Education and New Learning Technologies in Barcelona. The first paper was a presentation of the pilot study undertaken for this research (Jepson, Dewey & Delf, 2014), the second paper related to the development and design I employed for the autism learning resource entitled 'Using web based innovative technologies to creatively support undergraduate student learning: the creation of a learning resource using Articulate Storyline™ and WordPress™ (Jepson, 2014). I was also invited to 'chair' a session at the conference, which was highly illuminating, most enjoyable, and has led to increased professional networking in the area of TEL.

The role I have achieved reflects the sentiments of Davis and Eales (2007), who note that lecturers do not work in isolation, they are members of departments and different discipline groups, members of institutions and the wider tertiary education sector. At each level there are multiple critical factors related to management and organisation, collaboration, dissemination, and eLearning design, all of which have an influence upon institutional change. My work enabled me to collaborate on a university wide platform as an affiliated member of the Institute of Learning Innovation and Development (ILIaD), formerly the Centre for Innovation in Technologies and Education (CITE). The inaugural ILIaD conference was held in November 2014; my poster entitled 'Higher Education lecturers' experiences and perceptions of the transition from traditional face to face taught courses to an online environment utilising technology enhanced learning' was accepted for presentation and again afforded an opportunity to share my research with visiting and local colleagues (Appendix N).

7.3.2: Evaluating my research

Carrying out this research has been rewarding, but there are two key areas that I would like to finally reflect upon: the first relates to the survey tool, the second to ongoing research.

Firstly, with hindsight, now that I have completed this study, I would like to reflect on what I would do differently. I would certainly have used the more robust

definition of TEL, presented within the limitations section on p.149 which clearly emphasises TEL in the context of online learning and teaching.

I realise, on reflection, that the survey tool developed and administrated was somewhat ambitious, with many dimensions and factors included, these no doubt added to the complexity of data analysis for me whilst undertaking doctoral training. Reducing the number of factors within some of the dimensions, possibly by removing the learning style questionnaire from the Work motivation and learning styles dimension would enable this. Whilst I could not have predicted the results, removing the task technology and anticipated consequences of use from the dimension Participants perception of virtual learning environments, would suggest a more manageable conceptual model for measuring lecturers' engagement with TEL within health related education provision.

Reducing the length of the survey tool may also have been of benefit in relation to increasing response rates; whilst I was pleasantly surprised by the response rate, and hold enormous gratitude to those respondents who undoubtedly took the trouble to complete a very long questionnaire whilst carrying out their busy professional roles, increased numbers would add to the generalisation of the findings.

I would also have included a qualitative dimension to the streamlined survey tool by adding open questions to enable richer data to be collected. Exploring local policy in relation to the delivery of TEL, through open questions, would also have given strength to the findings. In conclusion, methodological triangulation, described by LoBiondo-Wood and Haber (2006) as involving the application and combination of several research methodologies in one study, utilising a mixed methodology, would have increased the confidence in the findings and thus strengthened the research.

Secondly, as well as considering the research recommendations presented in this study, I would like to further my research by going beyond descriptions to ask 'why'; to do this, I would utilise a mixed-method research approach to conduct an explanatory survey. To enable wider participation, it is my belief that collaborating with other universities would be more conducive to a study such as mine, likewise working with researchers representing other health professionals, not just nursing, would also add to the generalisation of findings. I would also like to widen

participation by collaborating with international colleagues; networking at the EDULEARN conference in Barcelona attracted interest in forming partnerships with academics in Saudi Arabia and New Zealand, these I am intending to follow-up on successful completion of my doctoral training.

7.4: Summary

In today's digital society, possessing more than basic technological skills is crucial for engagement in a participatory culture, both in education and in the provision of health care (Jones, Skirton, & McMullan, 2006; NHS, 2013; Pulman, Scammell, & Martin, 2009). Lecturers need dedicated localised support to provide learners with opportunities for utilising technology enhanced online resources, thus preparing for their future roles within healthcare environments. Empowering lecturers, especially when they are keen and motivated, with the technological knowledge and skills necessary for TEL, is paramount for modern education delivery. Continuing professional development, teacher training programmes and professional bodies, must promote engagement with technology by effectively utilising teaching approaches that address balanced learning styles. I am continuing to develop my role and am intending to employ the findings from my research in new ventures. I hope to support others in their research, particularly in the area of online learning and teaching with TEL, and will endeavour to support colleagues in the development and delivery of online learning and teaching resources. Lecturers' delivering education within the health science sector, need to be conversant and confident with technology in order to fulfil a teaching role which is in tune with 21st Century learners and 21st Century healthcare delivery.

REFERENCES

Adams, A. M. (2004). Pedagogical underpinnings of computer-based learning. *Journal of Advanced Nursing*, *46*(1), 5–12. doi:10.1111/j.1365-2648.2003.02960.

Adams, A., & Timmins, F. (2006). Students views of integrating web-based learning technology into the nursing curriculum - A descriptive survey. *Nurse Education in Practice*, *6*(1), 12–21. doi:10.1016/j.nepr.2005.05.005

Ahlgren, L., & Tett, L. (2010). Work-based learning, identity and organisational culture. *Studies in Continuing Education*, *32*(1), 17–27.doi: 10.1080/01580370903534280

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. doi:10.1016/j.iheduc.2008.05.002

Alderman, A. K., & Salem, B. (2010). Survey research. *Plastic and Reconstructive Surgery*, *126*(4), 1381–1389. doi: 10.1097/PRS.0b013e3181ea44f9

Aldunate, R., & Nussbaum, M. (2013). Teacher adoption of technology. *Computers in Human Behavior*, *29*(3), 519–524. doi:10.1016/j.chb.2012.10.017

Alexander, B. B. (2006). Web 2.0: A new wave of innovation for teaching and learning? *EDUCAUSE Review*, March/April, 33-44. doi: 10.1111/j.1471-1842.2007.00701.x

Amin, M. (2013). Blending technology and learning learning: A multi-faceted view. *ELT Voices*, *3*(2), 1–14. Retrieved from http://eltvoices.in/Volume3/Issue_2/EVI_32_1.pdf

Amirault, R. J. (2012). Distance learning in the 21st century university: Key issues for leaders and faculty. *The Quar terly Review of Distance Education*, *13*(4), 253–265.

An, Y.-J., & Williams, K. (2010). Teaching with web 2.0 technologies: benefits, barriers and lessons learned. *International Journal of Instructional Technologies and Distance Learning*, *7*, 41–48. www.itdl.org/Journal/Mar_10/article04.htm

Artvinli, E. (2010). The contribution of geographic information systems (GIS) to geography education and secondary school students' attitudes related to GIS. *Educational Sciences: Theory & Practice*, *10*(3), 1277–1292.

Bandura, A. (1977). *Social learning theory*. Englewoood Cliffs, New Jersey: Prentice Hall.

Barbeite, F. G., & Weiss, E. M. (2004). Computer self-efficacy and anxiety scales for an Internet sample: testing measurement equivalence of existing measures and development of new scales. *Computers in Human Behavior*, *20*(1), 1–15. doi:10.1016/S0747-5632(03)00049-9

Barrios, M., Villarroya, A., Borrego, A., & Olle, C. (2011). Response rates and data quality in web and mail surveys administered to PhD holders. *Social Science Computer Review*, *29*(2), 208–220. doi:10.1177/0894439310368031

Bayne, S. (2015). What's the matter with "technology-enhanced learning"? *Learning, Media and Technology*, *40*(1), 5–20. doi: abs/10.1080/17439884.2014.915851

Beasley, T. M., & Schumacker, R. E. (1995). Multiple regression approach to analyzing contingency tables: post hoc and planned comparison procedures. *The Journal of Experimental Education*, *64*(1), 79–93.

Beaven, T., Comas-Quinn, A., Hauck, M., de los Arcos, B., & Lewis, T. (2013). The open translation MOOC: creating online communities to transcend linguistic barriers. *Journal of Interactive Media in Education*, *3*(18), 1–14. doi:org/10.5334/2013-18

Bennett, S., Bishop, A., Dalgarno, B., Waycott, J., & Kennedy, G. (2012). Implementing web 2.0 technologies in higher education: A collective case study. *Computers & Education*, *59*(2), 524–534. doi:10.1016/j.compedu.2011.12.022

Berners-Lee, T. (1991). *World-wide web: An illustrated seminar.* Retrieved from http://www.w3.org/Talks/General.html

Bettany-Saltikov, J., & Whittaker, V. J. (2014). Selecting the most appropriate inferential statistical test for your quantitative research study. *Journal of Clinical Nursing*, *23*, 1520–1531. doi:10.1111/jocn.12343

Biggs, J. (2012). What the student does: teaching for enhanced learning. *Higher Education Research & Development*, *31*(1), 39–55. doi:10.1080/0729436990180105

Black, T. R. (1999). *Doing quantitative research in the social sciences: An integrated approach to research design, measurement, and statistics*. Thousand Oaks, CA: Sage Publications.

Blake, H. (2009). Staff perceptions of e-learning for teaching delivery in healthcare. *Learning in Health and Social Care*, *8*(3), 223–234. doi:10.1111/j.1473-6861.2009.00213.x

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. doi:10.1016/j.compedu.2007.09.017

Bloom, K. C., & Hough, M. C. (2003). Student satisfaction with technology-enhanced learning. *Computers, Informatics, Nursing*, *21*(5), 241–246. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/14504600

Bloomfield, J. G., & Jones, A. (2013). Using e-learning to support clinical skills acquisition: Exploring the experiences and perceptions of graduate first-year pre-registration nursing students - A mixed method study. *Nurse Education Today*, *33*(12), 1605–1611. doi:10.1016/j.nedt.2013.01.024

Bond, E., & Goodchild, T. (2013). Paradoxes and professionalism: An exploration of lecturers' perspectives on technology enhanced learning. *Journal of Applied Research in Higher Education, 5*(1), 72-83. doi.org/10.1108/17581181311310289

Boone, H. N. J., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension*, *50*(2), Article 2TOT2. Retrieved from http://ezproxy.lib.ed.ac.uk/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edo&AN=75361715&site=eds-live&scope=cite\nhttp://www.joe.org/joe/2012april/tt2p.shtml

British Educational Research Association. (2011). *Ethical guidelines for educational research*. London: BERA. Retrieved from https://www.bera.ac.uk/researchers-resources/publications/ethical-guidelines-for-educational-research-2011

Brown, S. A. (2012). Seeing web 2.0 in context: A study of academic perceptions. *The Internet and Higher Education*, *15*(1), 50–57. doi:10.1016/j.iheduc.2011.04.003

Brown, S. C. (2010). From VLEs to learning webs: the implications of web 2.0 for learning and teaching. *Interactive Learning Environments*, *18*(1), 1–10. doi:10.1080/10494820802158983

Browne, T., Hewitt, R., Jenkins, M., & Walker, R. (2008). *Survey of technology enhanced learning for higher education in the UK*. Oxford: UCISA, University of Oxford

Browne, T., & Jenkins, M. (2008, December). *Achieving academic engagement? The landscape for educational technology support in two UK institutions*. Paper presented at the meeting of Ascilite 2008 Melbourne

Bruner, J. S. (1996). *The culture of education*. Cambridge, MA: Harvard University Press.

Buchanan, E. A., & Hvizdak, E. E. (2009). Online survey tools: ethical and methodological concerns of human research ethics committees. *Journal of Empirical Research on Human Research Ethics*, *4*(2), 37–48. doi:10.1525/jer.2009.4.2.37

Bury, R., Martin, L., & Roberts, S. (2006). Achieving change through mutual development: supported online learning and the evolving roles of health and information professionals. *Health Information and Libraries Journal*, *23 Suppl 1*, 22–31. doi:10.1111/j.1471-1842.2006.00677.x

Button, D., Harrington, A., & Belan, I. (2013). E-learning & information communication technology (ICT) in nursing education: A review of the literature. *Nurse Education Today*, *34*(10), 1311–1323. doi:10.1016/j.nedt.2013.05.002

Cabral, A. P., & Huet, I. (2015). Growing separation between teaching/ learning and research – anticipating the impacts from REF 2014. *Compass: Journal of Learning and Teaching*, *6*(10). Retrieved from https://journals.gre.ac.uk/index.php/compass/article/view/205

Canrinus, E. T., Helms-Lorenz, M., Beijaard, D., Buitink, J., & Hoffman, A. (2012). Self-efficacy, job satisfaction, motivation and commitment: exploring the relationship between indicators of teachers' professional identity. *European Journal of Psychology Education*, *27*(1), 115–132. doi: 10.1007/s10212-011-0069-2

Carlson, V., & Olson, D. K. (2001). Technology enhanced learning/distance education: Market survey of occupational health and safety professionals. *American Industrial Hygiene Association*, *62*(3), 349–355. doi:10.1080/15298660108984637

Carr, S. M., Lhussier, M., & Chandler, C. (2010). The supervision of professional doctorates: Experiences of the processes and ways forward. *Nurse Education Today*, *30*(4), 279–284. doi:10.1016/j.nedt.2009.03.004

Check, J., & Schutt, R. K. (2012). *Research methods in education*. Thousand Oaks, CA: Sage.

Chen, C.-Y., Chang, R.-E., Hung, M.-C., & Lin, M.-H. (2008). Assessing the quality of a web-based learning system for nurses. *Journal of Medical Systems*, *33*(4), 317–325. doi:10.1007/s10916-008-9193-1

Cheng, Y.-M. (2011). Antecedents and consequences of e-learning acceptance. *Information Systems Journal*, *21*(3), 269–299. doi:10.1111/j.1365-2575.2010.00356.x

Childs, S., Blenkinsopp, E., Hall, A., & Walton, G. (2005). Effective e-learning for health professionals and students - barriers and their solutions. A systematic review of the literature--findings from the HeXL project. *Health Information and Libraries Journal*, *22 Suppl 2*, 20–32. doi:10.1111/j.1470-3327.2005.00614.x

Chinyio, E., & Morton, N. (2006). The Effectiveness of e-learning. *Architectural Engineering and Design Management*, *2*(1-2), 73–86. doi.org/10.1080/17452007.2006.9684606

Chiou, W.-B. (2008). College students' role models, learning style preferences and academic achievement in collaborative teaching: absolute versus relativistic thinking. *Adolescence*, *43*(169), 129–142.

Choi, I., Lee, S. J., & Kang, J. (2009). Implementing a case-based e-learning environment in a lecture-oriented anaesthesiology class: Do learning styles matter in complex problem solving over time? *British Journal of Educational Technology*, *40*(5), 933–947.doi: 10.1111/j.1467-8535.2008.00884.x

Churchill, T. J. (2011). *The impact of collaborative technology-enhanced learning on concepts of teaching (or Developing eCompetent professionals)* (Unpublished Doctor of Research in Education thesis), University of Leicester, Leicester.

Cochrane, T., Black, B., Lee, M., Narayan, V., & Verswijvelen, M. (2012). Rethinking e-learning support strategies. *International Journal for Academic Development*, 1–18. doi:10.1080/1360144X.2012.733884

Cohen, L., Manion, L., & Morrison, K. (2008). *Research methods in education* (6th ed.). London & New York: Routledge Taylor & Francis Group.

Collis, B., & Moonen, J. (2008). Web 2.0 tools and processes in higher education: quality perspectives. *Educational Media International*, *45*(2), 93–106. doi:10.1080/09523980802107179

Conole, G., & Fill, K. (2005). A learning design toolkit to create pedagogically effective learning activities. *Journal of Interactive Media in Education*. 2005(1), p.Art. 9. doi:org/10.5334/2005-8

Cragg, C. E. B., Edwards, N., Yue, Z., Xin, S. L., & Hui, Z. D. (2003). Integrating web-based technology into distance education for nurses in China: computer and internet access and attitudes. *Computers, Informatics, Nursing*, *21*(5), 265–274. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/14504603

Cresswell, J. W. (2013). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.

Crossan, F. (2003). Research philosophy: towards an understanding. *Nurse Researcher*, *11*(1), 46–55.

Curran, C. (2001). The phenomenon of on-line learning. *European Journal of Education*, *36*(2), 113–132. doi:10.1111/1467-3435.00055

Czerniewicz, L., & Cheryl, B. (2009). Intermediaries and infrastructure as agents: the mediation of e-learning policy and use by institutional culture. In T. Mayes, D. Morrison, H. Mellar, P. Bullen, & M. Oliver (Eds.), *Transforming higher education through technology-enhanced learning* (pp. 107–121). York: The Higher Education Academy.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *Management Information Systems Quarterly*, *13*(3), 319–340. Retrieved from http://www.jstor.org/discover/10.2307/249008?uid=3738032&uid=2&uid=4&sid=21106401313611

Davis, H., & Eales, S. (2007). Editorial introduction: BJET special issue on critical success factors in institutional change. *British Journal of Educational Technology*, *38*(5), 769–772.

Dearing, R. (1997). *Higher education in the learning society*. Leeds: Great Britain National Committee of Inquiry in Higher Education. Retrieved from http://hdl.voced.edu.au/10707/74031.

DeLone, W. H., & McLean, E. R. (1992). Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research*, *3*(1), 60–95. doi:10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success : A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. doi:10.1080/07421222.2003.11045748

Denscombe, M. (2010). *The good research guide* (4th ed.). Maidenhead: Open University Press.

Denzin, N. K., & Lincoln, Y. S. (2005). *The SAGE handbook of qualitative research* (3rd ed.). London: Sage Publications.

Department for Business, Innovation and Skills. (2015). *Fulfilling our potential: teaching excellence, social mobility and student choice*. Sheffield: Department for Business, Innovation and Skills.

Department of Health [DH]. (2011). *A framework for technology enhanced learning*. London: DH

Dray, B. J., Lowenthal, P. R., & Miszkiewicz, M. J. (2011). Developing an instrument to assess student readiness for online learning: a validation study. *Distance Education*, *32*(1), 29–47. doi:10.1080/01587919.2011.565496

Duan, Y., He, Q., Feng, W., Li, D., & Fu, Z. (2010). A study on e-learning take-up intention from an innovation adoption perspective: A case in China. *Computers & Education*, *55*(1), 237–246. doi:10.1016/j.compedu.2010.01.009

Dunn, R. (1984). Learning style: State of the science. *Theory into Practice*, *23*(1), 10–19. Retrieved from http://www.jstor.org/discover/10.2307/1476733?uid=3738032&uid=2&uid=4&sid=21106401313611

Dunn, R., & Honigsfeld, A. (2013). Learning styles: what we know and what we need. *The Educational Forum*, *77*(2), 225–232. doi: 10.1080/00131725.2013.765328

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*, *37*(5), 1–12. doi:10.14221/ajte.2012v37n5.4

Egan, T. M., Yang, B., & Bartlett, K. R. (2004). The effects of organizational learning culture and job satisfaction on motivation to transfer learning and turnover intention. *Human Resource Development Quarterly*, *15*(3), 279–301. doi:10.1002/hrdq.1104

Ellis, R. A., Bliuc, A.-M., & Goodyear, P. (2012). Student experiences of engaged enquiry in pharmacy education: digital natives or something else? *Higher Education*, *64*(5), 609–626. doi:10.1007/s10734-012-9515-6

Estabrooks, C. A., O'Leary, K. A., Ricker, K. L., & Humphrey, C. K. (2003). The Internet and access to evidence: how are nurses positioned? *Journal of Advanced Nursing*, *42*(1), 73–81. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12641814

European University Association [EUA]. (2007). *Doctoral programmes in Europe's universities: Achievements and challenges*. Brussels, Belgium: EUA. Retrieved from http://hdl.voced.edu.au/10707/329283.

Farkas, M. (2012). Participatory technologies, pedagogy 2.0 and information literacy. *Library Hi Tech*, *30*(1), 82–94. doi: 10.1108/07378831211213229

Felder, R. M. (1996). Matters of style. *ASEE Prism*, *6*(4), 18–23.Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/LS-Prism.htm

Felder, R. M., Litzinger, T. A., Lee, S. H., & Wise, J. C. (2005). A Study of the reliability and validity of the Felder-Soloman index of learning styles ©. In *American Society for Engineering Annual Conference & Exposition*. Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/Litzinger_Validation_Study.pdf

Felder, R. M., & Silverman, L. K. (1998). Learning and teaching styles. *Engineering Education*, *78*(7), 674–681. Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/Papers/LS-1988.pdf

Felder, R. M., & Soloman, B. A. (1993). Learning styles and strategies. Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/styles.htm

Felder, R. M., & Spurlin, J. (2005). Applications, reliability and validity of the index of learning styles*. *International Journal Engaging Education*, *21*(1), 103–112. Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/ILS_Validation(IJEE).pdf

Fenge, L. (2009). Professional Doctorates—A better route for researching professionals? *Social Work Education*, *28*(2), 165–176. doi: 10.1080/02615470701865733

Field, A. (2009). *Discoverying statistics using SPSS* (3rd ed.). London: Sage Publications.

Field, A., & Hole, G. (2003). *How to design and report experiments*. London: Sage Publications.

Filippidis, S. K., & Tsoukalas, I. A. (2009). On the use of adaptive instructional images based on the sequential–global dimension of the Felder–Silverman learning style theory. *Interactive Learning Environments*, *17*(2), 135–150. doi:10.1080/10494820701869524

Frith, K. H., & Kee, C. C. (2003). The effect of communication on nursing student outcomes in a web-based course. *The Journal of Nursing Education*, *42*(8), 350–358. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12938897

Fulton, J., Kuit, J., Sanders, G., & Smith, P. (2012). The role of the Professional Doctorate in developing professional practice. *Journal of Nursing Management*, *20*, 130–139. doi:10.1111/j.1365-2834.2011.01345.x

Furnham, A., Eracleous, A., & Chamorro-Premuzic, T. (2009). Personality, motivation and job satisfaction: Hertzberg meets the big five. *Journal of Managerial Psychology*, *24*(8), 765–779. doi: 10.1108/02683940910996789

Furnham, A., Forde, L., & Ferrari, K. (1999). Personality and work motivation. *Personality and Individual Differences*, *26*(6), 1035–1043. doi:10.1016/S0191-8869(98)00202-5

Garcia-Perez, M. A., & Nunez-Anton, V. (2003). Cellwise residual analysis in two-way contingency tables. *Educational and Psychological Measurement*, *63*(5), 825–839. doi:10.1177/0013164403251280

Gattiker, U. E., & Hlavka, A. (1992). Computer attitudes and learning performance: Issues for management education and training. *Journal of Organizational Behavior*, *13*(1), 89–101.

Gawel, J. (1997). Herzberg's theory of motivation and Maslow's hierarchy of needs. *Practical Assessment, Research and Evaluation, 5*(11), Retrieved from http://pareonline.net/getvn.asp?v=5&n=11

Gebre, E., Saroyan, A., & Bracewell, R. (2014). Students' engagement in technology rich classrooms and its relationship to professors' conceptions of effective teaching. *British Journal of Educational Technology*, *45*(1), 83–96. doi:10.1111/bjet.12001

Gilbert, L. (2011). *Study of Sacramento state staff and information technology*. Sacremento: California State University. Retrieved from http://www.csus.edu/irt/CIO/StrategicPlanning/Documents/Faculty-Technology-Survey2011.pdf

Gilchrist, M., & Wright, C. (2009). Analysis of quantitative data. In P. Moule & M. Goodman (Eds.), *Nursing research: An introduction* (pp. 323–342). London: Sage Publications.

Glasow, P. A. (2005). Fundamentals of survey research methodology. Retrieved from http://www.scribd.com/doc/58607173/Fundamentals-of-Survey-Research-Methodology#scribd

Glasper, E. A., Carpenter, D., Cowen, M., & Jepson, J. (2013). Designing the architecture of an undergraduate or master's evidence based practice health care dissertation. *Working Papers in Health Sciences*, *1*(2), 1–9.

Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technical Education*, *7*(1). Retrieved from http://scholar.lib.vt.edu/ejournals/JTE/v7n1/gokhale.jte-v7n1.html

Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *Management Information Systems Quarterly*, *19*(2), 213–236. Retrieved from http://www.jstor.org/stable/249689

Goodyear, P., & Retalis, S. (2010). Learning, technology and design. In P. Goodyear & S. Retalis (Eds.), *Technology-enhanced learning: design patterns and pattern languages* (pp. 1–27). Rotterdam/Boston/Raipei:Sense Publishers.

Govender, D., & Govender, I. (2009). The Relationship between information and communications technology (ICT) integration and teachers' self-efficacy beliefs about ICT. *Education as Change*, *13*(1), 153–165. doi:10.1080/16823200902943346

Graham, C. R., Woodfield, W., & Buckley Harrison, J. (2013). A framework for institutional adoption and implementation of blended learning in higher education. *Internet and Higher Education*, *18*, 4–14. doi:10.1016/j.iheduc.2012.09.003

Great Britain. (1998). *Data Protection Act*. London: Her Majesty's Stationery Office [HMSO].

Gregory, M. S.-J., & Lodge, J. M. (2015). Academic workload: the silent barrier to the implementation of technology-enhanced learning strategies in higher education. *Distance Education*, 1–21. doi: 10.1080/01587919.2015.1055056

Gupta, B., White, D. A., & Walmsley, A. D. (2004). The attitudes of undergraduate students and staff to the use of electronic learning. *British Dental Journal*, *196*(8), 487–492. doi:10.1038/sj.bdj.4811179

Hack, C. J. (2015). The benefits and barriers of using virtual worlds to engage healthcare professionals on distance learning programmes. *Interactive Learning Environments*, *4820* (March), 1–14. doi: 10.1080/10494820.2015.1057743

Hague, C., & Payton, S. (2010). *Digital literacy across the curriculum*. Bristol: Futurelab. Retrieved from www2.futurelab.org.uk/handbooks/digital_literacy.pdf

Hall, R., & Hall, M. (2010). Scoping the pedagogic relationship between self-efficacy and web 2.0 technologies. *Learning, Media and Technology*, *35*(3), 255–273. doi:10.1080/17439884.2010.485204

Halstead, J. A., & Coudret, N. A. (2000). Implementing web-based instruction in a school of nursing: Implications for faculty and students. *Journal of Professional Nursing*, *16*(5), 273–281. doi:10.1053/jpnu.2000.9459

Heaton-Shrestha, C., Edirisingha, P., Burke, L., & Linsey, T. (2005). Introducing a VLE into campus-based undergraduate teaching: Staff perspectives on its impact on teaching. *International Journal of Educational Research*, *43*(6), 370–386. doi:10.1016/j.ijer.2006.07.001

Hemmings, B. C., Kay, R., Sharp, J., & Taylor, C. (2012). A transnational comparison of lecturer self-efficacy. *Journal of Further and Higher Education*, *36*(3), 291–307. doi: 10.1080/0309877X.2011.614932

Higher Education Funding Council for England [HEFCE]. (2009). *Enhancing learning and teaching through the use of technology*. Retrieved from http://webarchive.nationalarchives.gov.uk/20100202100434/http://www.hefce.ac.uk/pubs/year/2009/200912/

Higher Education Funding Council for England [HEFCE]. (2011). *Collaborate to compete: Seizing the opportunity of online learning for UK higher education*. Retrieved from http://www.hefce.ac.uk/pubs/hefce/2011/11_01/

Higher Education Statistics Agency. (2009). Resources of higher education institutions 2007/08. Retrieved from https://www.hesa.ac.uk/

Higher Education Statistics Agency. (2012). Staff in higher education 2010/11. Retrieved from https://www.hesa.ac.uk/

Higher Education Statistics Agency. (2015). Staff in higher education 2013/14. Retrieved from https://www.hesa.ac.uk/

Hodges, C. B. (2008). Self-efficacy in the context of online learning environments: A review of the literature and directions for research. *Performance Improvement Quarterly*, *20*(3-4), 7–25. doi:10.1002/piq

Hollis, V., & Madill, H. (2006). Online learning : The potential for occupational therapy education. *Occupational Therapy International*, *13*(2), 61–78. doi:10.1002/oti

Inan, F. A., & Lowther, D. L. (2010). Factors affecting technology integration in K-12 classrooms: A path model. *Educational Technology Research and Development*, *58*(2), 137–154. doi:10.1007/s11423-009-9132-y

Jaffer, S. (2010). Educational technology pedagogy: A looseness of fit between learning theories and pedagogy. *Education as Change*, *14*(2), 273–287. doi:10.1080/16823206.2010.522066

Jamieson, S. (2004). Likert scales: How to (ab)use them. *Medical Education*, *38*(12), 1217–1218. doi:10.1111/j.1365-2929.2004.02012.x

Jepson, J. (2008). Facilitating student nurses' learning using online enquiry-based activities. *Journal of Children's and Young People's Nursing*, *2*(2), 90–93. doi: 10.12968/jcyn.2008.2.2.28202

Jepson, J. (2014). Using web based innovative technologies to creatively support undergraduate student learning: the creation of a learning resource using Articulate Storyline™ and WordPress™. In *Proceedings of the 6th International Conference on Education and New Learning Technologies* (pp. 1762-1769). Barcelona, Spain: EDULEARN 14.

Jepson, J., Dewey. A., & Delf, P. (2014). Lecturers' experiences and perceptions of the transition from traditional taught courses to an online (internet) environment utilising technology enhanced learning: A pilot study. In *Proceedings of the 6th International Conference on Education and New Learning Technologies* (pp. 1791-1802). Barcelona, Spain: EDULEARN 14.

Jepson, J., & Morgan, J. (2007). Facilitating students' autonomous learning using a wiki in health and social care education. In *New Learning 2.0? Emerging digital territories, developing continuities, new divides* (p. 25). Naples, Italy: European Distance and E-Learning Network.

JISC/UCISA. (2003). *Managed Learning Environment Activity in Further and Higher Education in the UK*. Brighton: The Social Informatics Research Unit, University of Brighton, Education for Change Ltd. Retrieved from http://www.jisc.ac.uk/media/documents/programmes/buildmlehefe/mlestudyfinalreport.pdf

Johnson, A. E. (2008). A nursing faculty's transition to teaching online. *Nursing Education Perspectives*, *29*(1), 17-22. Retrieved from http://www.redorbit.com/news/education/1261337/a_nursing_facultys_transition_to_teaching_online/

Jones, M. G., & Harmon, S. W. (2002). What professors need to know about technology to assess on-line student learning. *New Directions for Teaching and Learning*, *2002*(91), 19–30. doi:10.1002/tl.62

Jones, M. W., & Dexter, S. (2014). How teachers learn: the roles of formal, informal, and independent learning. *Education Technology Research Development*, *62*(3), 367–384. doi: 10.1007/s11423-014-9337-6

Jones, R., Skirton, H., & McMullan, M. (2006). Feasibility of combining e-health for patients with e-learning for students using synchronous technologies. *Journal of Advanced Nursing*, *56*(1), 99–109. doi:10.1111/j.1365-2648.2006.03984.x

Joo, Y.-J., Bong, M., & Choi, H.-J. (2000). Self-efficacy for self-regulated learning, academic self-efficacy, and internet self-efficacy in web-based instruction. *Educational Technology Research and Development*, *48*(2), 5–17. doi:10.1007/BF02313398

Joo, Y.-J., Lim, K. Y., & Kim, J. (2013). Locus of control, self-efficacy, and task value as predictors of learning outcome in an online university context. *Computers and Education*, *62*, 149–158. doi:10.1016/j.compedu.2012.027

Jump, L. (2011). Why university lecturers enhance their teaching through the use of technology: A systematic review. *Learning, Media and Technology*, *36*(1), 55–68. doi:10.1080/17439884.2010.521509

Junglas, I., Abraham, C., & Ives, B. (2009). Mobile technology at the frontlines of patient care: Understanding fit and human drives in utilization decisions and performance. *Decision Support Systems*, *46*(3), 634–647. doi:10.1016/j.dss.2008.11.012

Kamel Boulos, M. N., & Wheeler, S. (2007). The emerging web 2.0 social software: an enabling suite of sociable technologies in health and health care education. *Health Information and Libraries Journal*, *24*(1), 2–23. doi:10.1111/j.1471-1842.2007.00701.x

Kelley, K., Clark, B., Brown, V., & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, *15*(3), 261–266. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12803354

Kelly, U., McNicoll, I., & White, J. (2014). *The impact of universities on the UK economy*. London: Universities UK. Retrieved from http://www.universitiesuk.ac.uk/highereducation/Pages/ImpactOfUniversities.aspx

Kember, D. (1997). A reconceptualisation of the research into university academics' conceptions of teaching. *Learning and Instruction*, *7*(3), 255–275. doi:10.1016/S0959-4752(96)00028-X

Kent, R. (2001). *Data construction and data analysis for survey research*. Houndmills, Basingstoke: Palgrave Macmillan.

Kettle, J. (2013). *Flexible Pedagogies: employer engagement and work-based learning*. York: The Higher Education Academy

Killion, C. M. (2001). Understanding cultural aspects of health through photography. *Nursing Outlook*, *49*(1), 50–54. doi:10.1067/mno.2001.110011

Kim, M. C., & Hannafin, M. J. (2011). Scaffolding problem solving in technology-enhanced learning environments (TELEs): Bridging research and theory with practice. *Computers & Education*, *56*(2), 403–417. doi:10.1016/j.compedu.2010.08.024

Kinchin, I. M., Lygo-Baker, S., & Hay, D. B. (2008). Universities as centres of non-learning. *Studies in Higher Education*, *33*(1), 89–103. doi:10.1080/03075070701794858

Kinniburgh, J. (2010). A constructivist approach to using GIS in the New Zealand classroom. *New Zealand Geographer*, *66*(1), 74–84. doi:10.1111/j.1745-7939.2010.01174.x

Kirkwood, A. (2009). Elearning: you don't always get what you hope for. *Technology, Pedagogy and Education*, *18*(2), 107–121. doi:10.1080/14759390902992576

Kirkwood, A., & Price, L. (2011a). *Enhancing learning and teaching through technology : a guide to evidence-based practice for academic developers.* York, UK: Higher Education Academy.

Kirkwood, A., & Price, L. (2011b). *Enhancing learning and teaching through technology : a guide to evidence-based practice for policy makers. Higher Education Academy*. York, UK: Higher Education Academy.

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: what is "enhanced" and how do we know? A critical literature review. *Learning, Media and Technology*, *39*(1), 6–36. doi:10.1080/17439884.2013.770404

Knowles, M. S. (1980). *The modern practice of adult education: From pedagogy to andragogy*. New Jersey: Cambridge Adult Education.

Kopcha, T. J. (2012). Teachers' perceptions of the barriers to technology integration and practices with technology under situated professional development. *Computers and Education*, *59*(4), 1109–1121. doi:10.1016/j.compedu.2012.05.014

Kot, F. C., & Hendel, D. D. (2012). Emergence and growth of professional doctorates in the United States, United Kingdom, Canada and Australia: a comparative analysis. *Studies in Higher Education*, *37*(3), 345–364. doi:10.1080/03075079.2010.516356

Kotrlik, J., Williams, H., & Jabor, K. (2011). Reporting and interpreting effect size in quantitative agricultural education research. *Journal of Agricultural Education*, *52*(1), 132–142. doi:10.5032/jae.2011.01132

Krause, K.-L. (2007). Beyond classroom walls: Students' out-of-class peer experiences and implications for teaching and learning. *Nagoya Journal of Higher Education*, *7*, 301–319. Retrieved from http://www.cshe.nagoya-u.ac.jp/publications/journal/no7/18.pdf

Kreber, C. (1998). The relationships between self-directed learning, critical thinking, and psychological type, and some implications for teaching in higher education. *Studies in Higher Education*, *23*(1), 71–86. doi: 10.1080/03075079812331380502

Kregor, G., Breslin, M., & Fountain, W. (2012). Experience and beliefs of technology users at an Australian university: Keys to maximising e-learning potential. *Australian Journal of Educational Technology*, *28*(8), 1382–1404. Retrieved from http://www.ascilite.org.au/ajet/ajet28/kregor.html

Lancaster, G. A., Dodd, S., & Williamson, P. R. (2004). Design and analysis of pilot studies: recommendations for good practice. *Journal of Evaluation in Clinical Practice*, *10*(2), 307–312.

Laurillard, D. (2007). Modelling benefits-oriented costs for technology enhanced learning. *Higher Education*, *54*, 21–39. doi:10.1007/s10734-006-9044-2

Laurillard, D., Charlton, P., Craft, B., Dimakopoulos, D., Ljubojevic, D., Magoulas, G., … Whittlestone, K. (2013). A constructionist learning environment for teachers to model learning designs. *Journal of Computer Assisted Learning*, *29*, 15–30.doi: 10.1111/j.1365-2729.2011.00458.x

Lawal, M. (2009). Reconciling methodological approaches of survey and focus group. *Nurse Researcher*, *17*(1), 54–61. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/19911654

Lawless, K., & Pellegrino, J. (2007). Professional development in integrating technology into teaching and learning: knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research*, *77*(4), 575–614.

Lawson, T., Comber, C., Gage, J., & Cullum-Hanshaw, A. (2010). Images of the future for education? Videoconferencing: a literature review. *Technology Enhanced Learning*, *19*(3), 295–314. doi:10.1080/1475939X.2010.513761

Leitch, S. (2006). *Prosperity for all in the global economy - world class skills*. Norwich: HMSO. Retrieved from http://webarchive.nationalarchives.gov.uk/20130129110402/http://hm-treasury.gov.uk/d/leitch_finalreport051206.pdf

Less, K. H. (2003). *Faculty adoption of computer technology for instruction in the North Carolina community college system* (Doctor of Education in Educational Leadership Thesis). East Tennessee State University, Tennessee. Retrieved from http://dc.etsu.edu/etd/782

Lewis, S. (2015). Qualitative inquiry and research design: choosing among five approaches. *Health Promotion Practice*, *16*(4), 473–475. doi:10.1177/1524839915580941

Lindquist, T., & Long, H. (2011). How can educational technology facilitate student engagement with online primary sources?: A user needs assessment. *Library Hi Tech*, *29*(2), 224–241. doi:10.1108/07378831111138152

Lingard, M. (2007). *Why don't all lecturers make use of VLEs? What can the so-called "Laggards" tell us?* (Post-graduate MA Information and Communications Technology in Education dissertation). Institute of Education, University of London, London. Retrieved from http://eprints.lse.ac.uk/28529/

Litwin, M. S. (1995). *How to measure survey reliability and validity*. London: Sage Publications.

Litzinger, T.A., Lee, S.H., & Felder, R.M. (2007). A psychometric study of the index of learning styles. *Journal of Engineering Education, 96*(4), 309-319. Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/ILS_Validation(JEE-2007).pdf

Livesey, F., Sullivan, E. O., Hughes, J., & Valli, R. (2008). *A pilot study on the emergence of university- level innovation policy in the UK* (No. 2008/1). *Centre for Economics and Policy Working Paper Series*. Cambridge: Centre for Economics and Policy, University of Cambridge.

LoBiondo-Wood, G., & Haber, J. (2006). *Nursing research: Methods and critical appraisal for evidence-based practice* (6th ed.). Marrickville, NSW: Mosby Elsevier.

Logan, K., & Neumann, T. (2010). *Comparison of Blackboard 9.1 and Moodle 2.0*. London. Retrieved from http://www.lkl.ac.uk/LTU/Publications

Loogma, K., Kruusvall, J., & Ümarik, M. (2012). E-learning as innovation: Exploring innovativeness of the VET teachers' community in Estonia. *Computers & Education*, *58*(2), 808–817. doi:10.1016/j.compedu.2011.10.005

Lowry, M., & Johnson, M. (1999). Computer assisted learning: the potential for teaching and assessing in nursing. *Nurse Education Today*, *19*(7), 521–6. doi:10.1054/nedt.1999.0390

Lusted, D. (1986). Why pedagogy? *Screen*, *27*(5), 2–16. doi: 10.1093/screen/27.5.2

Lyndon, S., & Hale, B. (2014). Evaluation of how the blended use of a virtual learning environment (VLE) can impact on learning and teaching in a specific module. *Enhancing Learning in the Social Sciences*, *6*(1), 56–65. 10.11120/elss.2014.00019

Maloney, E. J. (2007). What web 2.0 can teach us about learning. *Chronicle of Higher Education*, *53*(18), 26. Retrieved from https://www.evernote.com/shard/s18/note/9ef8478e-b0c5-45c2-95dd-382015f481ae/meganpoore/education#b=17c48c0e-bbf6-438c-8ed5-098a3d982620&n=9ef8478e-b0c5-45c2-95dd-382015f481ae

Maltby, J., Day, L., & Williams, G. (2007). *Introduction to statistics for nurses*. Harlow: Pearson Education.

Mansvelt, J., Suddaby, G., O'Hara, D., & Gilbert, A. (2009). Professional development: assuring quality in e-learning policy and practice. *Quality Assurance in Education*, *17*(3), 233–249. doi:10.1108/09684880910970641

Mark, G., & Smith, A. P. (2012). Effects of occupational stress, job characteristics, coping, and attributional style on the mental health and job satisfaction of university employees. *Anxiety, Stress, & Coping*, *25*(1), 63–78. doi:10.1080/10615806.2010.548088

Martin, S. (2010). Teachers using learning styles: Torn between research and accountability? *Teaching and Teacher Education*, *26*(8), 1583–1591. doi: 10.1016/j.tate.2010.06.009

Mayes, T., Morrison, D., Mellar, H., Bullen, P., & Oliver, M. (2009). *Transforming higher education through technology-enhanced learning*. York: The Higher Education Academy.

McBurney, D. H., & White, T.L. (2013). *Research Methods* (9th ed.). California: Wadsworth.

McGill, T. J., & Hobbs, V. J. (2007). How students and instructors using a virtual learning environment perceive the fit between technology and task. *Journal of Computer Assisted Learning*, *24*(3), 191–202. doi:10.1111/j.1365-2729.2007.00253.x

McGugan, S., & Peacock, S. (2005). Learning technology and its potential to support student placements in hospitality and tourism education. *The Journal of Hospitality, Leisure, Sport and Tourism Education*, *4*(1), 15–29. doi: 10.3794/johlste.41.50

McLinden, M. (2013). *Flexible pedagogies : part-time learners and learning in higher education*. University of Birmingham: The Higher Education Academy.

McLoughlin, C., & Lee, M. J. W. (2007). Future learning landscapes: transforming pedagogy through social software. *Innovate: Journal of Online Education*, *4*(5). Retrieved from http://www.editlib.org/p/104240/

Melville, D. (2009). *Higher education in a web 2.0 world: report of an independent committee of inquiry into the impact on higher education of students widespread use of web 2.0 technologies*. London:JISC. Retrieved from http://www.voced.edu.au/content/ngv10719

Merriam-Webster. (2015). *Your Dictionary*. Retrieved from http://www.yourdictionary.com/faculty#websters/dynamics#websters

Mertler, C. A., & Vannatta, R. A. (2005). *Advanced and multivariate statistical methods: practical application and interpretation.* (3rd ed.). Los Angeles: Pyrczak Publishing.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017–1054. doi:10.1111/j.1467-9620.2006.00684.x

Morris, N., Buck-Rolland, C., & Gagne, M. (2002). From bricks to bytes: Faculty and student perspectives of online graduate nursing courses. *Computers, Informatics, Nursing*, *20*(3), 108–114. doi:10.1097/00024665-200205000-00010

Moule, P., & Goodman, M. (2009). *Nursing research*. London: Sage Publications.

Moule, P., Ward, R., & Lockyer, L. (2010). Nursing and healthcare students' experiences and use of e-learning in higher education. *Journal of Advanced Nursing*, *66*(12), 2785–95. doi:10.1111/j.1365-2648.2010.05453.x

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 and Education*, *51*(4), 1523–1537. doi:10.1016/j.compedu.2008.02.003

Muirhead, R. J. (2007). E-learning: is this teaching at students or teaching with students? *Nursing Forum*, *42*(4), 178–184. doi: 10.1111/j.1744-6198.2007.00085.x

Murtaugh, P. A. (2014). In defense of *p* values. *Ecology*, *95*(3), 611–617. doi:10.1890/13-0590.1

National Health Service. (2015). *Health Education England: Technology Enhanced Learning*. Retrieved from http://hee.nhs.uk/work-programmes/tel/

Nemanich, L., Banks, M., & Vera, D. (2009). Enhancing knowledge transfer in classroom versus online settings: The interplay among instructor, student, content, and context. *Decision Sciences Journal of Innovative Education*, *7*(1), 123–148. doi:10.1111/j.1540-4609.2008.00208.x

Newland, B., & Byles, L. (2014). Changing academic teaching with web 2.0 technologies. *Innovations in Education and Teaching International*, *51*(3), 315–325. doi: 10.1080/14703297.2013.796727

Norman, G. (2010). Likert scales, levels of measurement and the "laws" of statistics. *Advances in Health Sciences Education: Theory and Practice*, *15*(5), 625–632. doi:10.1007/s10459-010-9222-y

Norton, L., Richardson, T. E., Hartley, J., Newstead, S., & Mayes, J. (2005). Teachers' beliefs and intentions concerning teaching in higher education. *Higher Education*, *50*(4), 537–571. doi:10.1007/s10734-004-6363-z

Nosek, B. A., Banaji, M. R., & Greenwald, A. G. (2002). E-research: ethics, security, design, and control in psychological research on the Internet. *Journal of Social Issues*, *58*(1), 161–176. doi:10.1111/1540-4560.00254

Nworie, J. (2014). Developing and sustaining instructional and technological innovations in teaching and learning. *Journal of Applied Learning Technology*, *4*(4), 5–14.

Osgerby, J. (2013). Students' perceptions of the introduction of a blended learning environment: An exploratory case study. *Accounting Education*, *22*(1), 85–99. doi: 10.1080/09639284.2012.729341

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 and Education*, *55*(3), 1321–1335. doi:10.1016/j.compedu.2010.06.002

Owens, T. (2012). Hitting the nail on the head: the importance of specific staff development for effective blended learning. *Innovations in Education and Teaching International*, *49*(4), 389–400.

Oye, N. D., Iahad, A. N., & Rahim, A. N. (2012). Computer self-efficacy, anxiety and attitudes towards use of technology among university academicians. *International Journal of Computer Science and Technology*, *3*(1), 213–219.

Paechter, M., Maier, B., & Macher, D. (2010). Students' expectations of, and experiences in e-learning: Their relation to learning achievements and course satisfaction. *Computers & Education*, *54*(1), 222–229. doi:10.1016/j.compedu.2009.08.005

Pajo, K., & Wallace, C. (2001). Barriers to the uptake of web-based technology by university teachers. *The Journal of Distance Education*, *16*(1), 70–84.

Palaigeorgiou, G., Triantafyllakos, G., & Tsinakos, A. (2011). What if undergraduate students designed their own web learning environment? Exploring students' web 2.0 mentality through participatory design. *Journal of Computer Assisted Learning*, *27*(2), 146–159. doi:10.1111/j.1365-2729.2010.00382.x

Pallant, J. (2013). *SPSS survival manual* (5th ed.). Maidenhead: McGraw Hill.

Panacek, E. A. (2008). Survey-based research: general principles. *Air Medical Journal*, *27*(1), 14–16. doi:10.1016/j.amj.2007.10.008

Parahoo, K. (2006). *Nursing research: Principles, process and issues.* (2nd ed.). Houndmills, Basingstoke: Palgrave Macmillan.

Parpala, A., Lindblom-Ylänne, S., Komulainen, E., Litmanen, T., & Hirsto, L. (2010). Students' approaches to learning and their experiences of the teaching-learning environment in different disciplines. *The British Journal of Educational Psychology*, *80*(2), 269–282. doi:10.1348/000709909X476946

Pashler, H., McDaniel, M., Rohrer, D., & Bjork, R. (2009). Learning styles: Concepts and evidence. *Psychological Science in the Public Interest*, *9*(Supplement), 105–119. doi 10.1111/j.1539-6053.2009.01038.x

Pate, A., Smaldino, S., Mayall, H., & Luetkehans, L. (2009). Questioning the necessity of nonacademic social discussion forums within online courses. *Quarterly Review of Distance Education*, *10*(1), 1–8. Retrieved from http://www.uwex.edu/disted/conference/Resource_library/proceedings/08_13093.pdf

Peters, O. (2000). Digital learning environments: New possibilities and opportunities heteronomous learning. *International Review of Research in Open and Distance Learning*, *1*(1), 1–19. Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/3/336

Petty, J. (2013). Interactive, technology-enhanced self-regulated learning tools in healthcare education: A literature review. *Nurse Education Today*, *33*(1), 53–59. doi:10.1016/j.nedt.2012.06.008

Piaget, J. (1976). *The child's construction of reality*. London: Routledge & Kegan Paul.

Polit, D. F., & Beck, C. T. (2014). *Essentials of nursing research: Appraising evidence for nursing practice* (4th ed.). Philadelphia: Lippincott Williams & Wilkins.

Polonsky, M. J., & Waller, D. S. (2011). Ethical considerations. In *Designing and managing a research project* (2nd ed., pp. 65–84). Thousand Oaks, CA: Sage Publications.

Postareff, L., Katajavuori, N., Lindblom-Ylänne, S., & Trigwell, K. (2008). Consonance and dissonance in descriptions of teaching of university teachers. *Studies in Higher Education*, *33*(1), 49–61. doi:10.1080/03075070701794809

Premkumar, K., Ross, A. G., Lowe, J., Troy, C., Bolster, C., & Reeder, B. (2010). Technology-enhanced learning of community health in undergraduate medical education. *Canadian Journal of Public Health. Revue Canadienne de Santé Publique*, *101*(2), 165–70. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/20524384

Prensky, M. (2001). Digital natives, digital immigrants: Part 1. *On the Horizon*, *9*(5), 1–6. doi: 10.1108/10748120110424816

Price, L., Richardson, J. T. E., & Jelfs, A. (2007). Face-to-face versus online tutoring support in distance education. *Studies in Higher Education*, *32*(1), 1–20. doi:10.1080/03075070601004366

Pridmore, J. L., & Bradley, R. V. (2010). Methods of instruction and learning outcomes: A theoretical analysis of two approaches in an introductory information technology course. *Decision Sciences Journal of Innovative Education*, *8*(2), 289–311. doi:10.1111/j.1540-4609.2010.00258.x

Prosser, M., & Trigwell, K. (1999). *Understanding learning and teaching: The experience in higher education*. Buckingham: Open University Press.

Pulman, A., Scammell, J., & Martin, M. (2009). Enabling interprofessional education: The role of technology to enhance learning. *Nurse Education Today*, *29*(2), 232–239. doi:10.1016/j.nedt.2008.08.012

Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research* (4th ed.). San Francisco: Jossey Bass.

Redmann, D. H., & Kotrlik, J. W. (2009). Family and consumer sciences teachers' adoption of technology for use in secondary classrooms. *Journal of Family and Consumer Sciences Education*, *27*(1), 29–45. Retrieved from http://www.public.iastate.edu/~laanan/ACTER/pdfs/Teachers_Technology.pdf

Reed, P. (2014). Staff experience and attitudes towards technology-enhanced learning initiatives in one faculty of health and life sciences. *Research in Learning Technology*, *22*(1063519), 1–23. doi:10.3402/rlt.v22.22770

Reeves, P. M., & Reeves, T. C. (2008). Design considerations for online learning in health and social work education. *Learning in Health and Social Care*, *7*(1), 46–58. doi.wiley.com/10.1111/j.1473-6861.2008.0017

Regan, K., Evmenova, A., Baker, P., Jerome, M. K., Spencer, V., Lawson, H., & Werner, T. (2012). Internet and higher education experiences of instructors in online learning environments: Identifying and regulating emotions. *The Internet and Higher Education*, *15*(3), 204–212. doi:10.1016/j.iheduc.2011.12.001

Richardson, J. T. E. (2005). Students' approaches to learning and teachers' approaches to teaching in higher education. *Educational Psychology*, *25*(6), 673–680. doi:10.1080/01443410500344720

Richardson, V. (2003). Constructivist pedagogy. *Teachers College Record*, *105*(9), 1623–1640. doi:10.1046/j.1467-9620.2003.00303.x

Richardson, W. (2006). *Blogs, wikis, podcasts, and other powerful web tools for classrooms*. Thousand Oaks, CA: Corwin Press, Sage Publications.

Robertson, J. (2012). Likert-type scales, statistical methods, and effect sizes. *Communications of the ACM*, *55*(5), 6. doi: 10.1145/2160718.2160721

Robin, B. R., McNeil, S. G., Cook, D. A., Agarwal, K. L., & Singhal, G. R. (2011). Preparing for the changing role of instructional technologies in medical education. *Academic Medicine*, *86*(4), 435–439. doi:10.1097/ACM.0b013e31820dbee4

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York: The Free Press.

Rolfe, G. (2014). Reach touch and teach. Terry Borton. *Nurse Education Today*, *34*(4), 488–489. doi: 10.1016/j.nedt.2013.11.003

Rovai, A. P. (2002). Development of an instrument to measure classroom community. *The Internet and Higher Education*, *5*(3), 197–211. doi:10.1016/S1096-7516(02)00102-1

Rovai, A. P., Ponton, M. K., Derrick, M. G., & Davis, J. M. (2006). Student evaluation of teaching in the virtual and traditional classrooms: A comparative analysis. *The Internet and Higher Education*, *9*(1), 23–35. doi:10.1016/j.iheduc.2005.11.002

Rudestam, K. E., & Newton, R. R. (2007). *Surviving your dissertation: a comprehensive guide to content and process* (3rd ed.). Los Angeles: Sage Publications.

Rudman, N. P. C. (2013). A critical reflection of self in context-first steps towards the professional doctorate. *Reflective Practice*, *14*(2), 183–195. doi:10.1080/14623943.2012.749226

Ryan, A., & Tilbury, D. (2013). *Flexible Pedagogies: New pedagogical ideas*. York, UK.

Saeed, N., Yang, Y., & Sinnappan, S. (2009). Emerging web technologies in higher education: A case of incorporating blogs, podcasts and social bookmarks in a web programming course based on students' learning styles and technology preferences. *Educational Technology & Society*, *12*(4), 98–109. Retrieved from http://www.editlib.org/p/74995/

Sahin, I., & Thompson, A. (2007). Analysis of predictive factors that influence faculty members' technology adoption level. *Journal of Technology and Teacher Education*, *15*(2), 167–190. Retrieved from http://www.editlib.org/p/18935/

Salaway, G., Katz, R. N., & Caruso, J. (2006). Student ownership of, use of, and skill with information technology. In *The ECAR study of undergraduate students and information technology* (pp. 35–56). Retrieved from https://net.educause.edu/ir/library/pdf/ERS0607/ERS06074.pdf

Salinas, M. F. (2008). From Dewey to Gates: A model to integrate psychoeducational principles in the selection and use of instructional technology. *Computers & Education*, *50*(3), 652–660. doi:10.1016/j.compedu.2006.08.002

Salmon, G. (2005). Flying not flapping: a strategic framework for e-learning and pedagogical innovation in higher education institutions. *Association for Learning Technology*, *13*(3), 201–218. doi:10.1080/09687760500376439

Salmon, G. (2011). Leading innovation for the 21st century. In U. D. Ehlers & D. Schneckenberg (Eds.), *Changing cultures in higher education: Moving ahead to future learning* (pp. 27–42). New York: Springer.

Schmieder, E. J. (2008). Communication: The tool to interact with and control your online classroom environment. *International Journal of Instructional Technology and Distance Learning*, *5*(3). Retrieved from http://www.itdl.org/Journal/Mar_08/index.htm

Schneckenberg, D. (2009). Understanding the real barriers to technology-enhanced innovation in higher education. *Educational Research*, *51*(4), 411–424. doi:10.1080/00131880903354741

Schneckenberg, D., Ehlers, U., & Adelsberger, H. (2011). Web 2.0 and competence-oriented design of learning-Potentials and implications for higher education. *British Journal of Educational Technology*, *42*(5), 747–762. doi:10.1111/j.1467-8535.2010.01092.x

Schneckenberg, D., & Wildt, J. (2006). Towards a conceptualisation of eCompetence in higher education. In I. Mac Labhrainn, C. McDonald Legg, D. Schneckenberg, & J. Wildt (Eds.), *The challenge of ecompetence in academic staff development* (pp. 29–35). Galway, Ireland: CELT, NUI Galway. Retrieved from Retrieved from http://www.ecompetence.info/uploads/media/ch3.pdf#search=%22%22Understanding%20the%20concept%20of%20ecompetence%22%22

Schunk, D. H. (2000). *Learning theories: An educational perspective* (3rd ed.). New Jersey: Merrill.

Secomb, J. M., & Smith, C. (2011). A mixed method pilot study: the researchers' experiences. *Contemporary Nurse*, *39*(1), 31–5. doi:10.5172/conu.2011.39.1.31

Sellar, S. (2009). The responsible uncertainty of pedagogy. *Discourse: Studies in the Cultural Politics of Education*, *30*(3), 347–360. doi:10.1080/01596300903037077

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. doi:10.1111/j.1365-2729.2006.00204.x

Selwyn, N. (2010). Looking beyond learning: notes towards the critical study of educational technology. *Journal of Computer Assisted Learning*, *26*(1), 65–73. doi:10.1111/j.1365-2729.2009.00338.x

Setterstrom, A. J., Pearson, J. M., & Orwig, R. A. (2013). Web-enabled wireless technology: An exploratory study of adoption and continued use intentions. *Behaviour & Information Technology*, *32*(11), 1139–1154. doi:10.1080/0144929X.2012.708785

Shah, R., & Cunningham, S. J. (2009). Implementation of the virtual learning environment into a UK orthodontic training programme: the postgraduate and lecturer perspective. *European Journal of Dental Education*, *13*(4), 223–32. doi:10.1111/j.1600-0579.2009.00579.x

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. doi:10.1111/bjet.12051

Siemens, G. (2004). *Connectivism: A learning theory for the digital age*. Retrieved from http://www.ingedewaard.net/papers/connectivism/2005_siemens_ALearningTheoryForTheDigitalAge.pdf

Simosi, M. (2012). The moderating role of self-efficacy in the organizational culture-training transfer relationship. *International Journal of Training and Development*, *16*(2), 92–106. doi:10.1111/j.1468-2419.2011.00396.x

Smith, M. M., & Macdonald, D. (2015). Assessing quality and effectiveness in fully online distance education. *Journal of Perspectives in Applied Academic Practice*, *3*(1), 24–38. Retrieved from http://jpaap.napier.ac.uk/index.php/JPAAP/article/view/147

Smith, N.-J. (2009). *Achieving your Professional Doctorate*. Maidenhead: Open University Press.

Smith, S., & Caruso, J. (2010). Technology adoption and ownership of IT. In *The ECAR study of undergraduate students and information technology* (pp. 37–53). Retrieved from http://net.educause.edu/ir/library/pdf/ers1006/rs/ers10064.pdf

Spronken-Smith, R., Bullard, J., Ray, W., Roberts, C., & Keiffer, A. (2008). Where might sand dunes be on Mars? Engaging students through inquiry-based learning in geography. *Journal of Geography in Higher Education*, *32*(1), 71–86. doi:10.1080/03098260701731520

Steenhuis, H.-J., & de Bruijn, E. J. (2006). Empirical research in OM: three paradigms. Retrieved from http://doc.utwente.nl/73618/1/empirical.pdf

Stein, S. J., Shephard, K., & Harris, I. (2011). Conceptions of e-learning and professional development for e-learning held by tertiary educators in New Zealand. *British Journal of Educational Technology*, *42*(1), 145–165. doi:10.1111/j.1467-8535.2009.00997.x

Stes, A., & Van Petegem, P. (2012). Profiling approaches to teaching in higher education: a cluster-analytic study. *Studies in Higher Education*, *39*(4), 644–658. doi:10.1080/03075079.2012.729032

Strang, K. D. (2012). Skype synchronous interaction effectiveness in a quantitative management science course. *Decision Sciences Journal of Innovative Education*, *10*(1), 3–23. doi:10.1111/j.1540-4609.2011.00333.x

Straub, E. T. (2009). Understanding technology adoption: Theory and future directions for informal learning. *Review of Educational Research*, *79*(2), 625–649. doi:10.3102/0034654308325896

Sue, V. M., & Ritter, L. A. (2012). *Conducting online surveys* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Sun, P., Tsai, R., Finger, G., Chen, Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & Education*, *50*(4), 1183–1202. Retrieved from http://linkinghub.elsevier.com/retrieve/pii/S0360131506001874

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, *24*(4), 413–424.

Teo, T., Lee, C. B., & Chai, C. S. (2007). Understanding pre-service teachers' computer attitudes: applying and extending the technology acceptance model. *Journal of Computer Assisted Learning*, *24*(2), 128–143. Retrieved from http://www.ascilite.org.au/ajet/ajet24/teo.html

The Complete University Guide. (2014). Top UK university subject tables and rankings 2015. Retrieved from http://www.thecompleteuniversityguide.co.uk/league-tables/rankings?s=Nursing

The Higher Education Academy. (2015). *Framework for flexible learning in higher education*. York, UK. Retrieved from www.heacademy.ac.uk

The Higher Education Academy. (2016). Response to fulfilling our potential: Teaching excellence, social mobility and student choice - consultation. Retrieved from https//www.heacademy.ac.uk/sites/default/files/downloads/bis-15-623-rf-response-form-hea_final.pdf

Thorpe, M., & Edmunds, R. (2011). Practices with technology: learning at the boundary between study and work. *Journal of Computer Assisted Learning*, *27*(5), 385–398.doi: doi.wiley.com/10.1111/j.1365-2729.2010.00405.x

Totten, V. Y., Panacek, E.A., & Price, D. (1999). Basics of research (Part 14). Survey research methodology: designing the survey instrument. *Air Medical Journal*, *18*(1), 26–34. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/10345782

Trigwell, K., & Prosser, M. (1996). Changing approaches to teaching: A relational perspective. *Studies in Higher Education*, *21*(3), 275–284. doi: 10.1080/03075079612331381211

Tsai, Y. (2011). Relationship between organizational culture, leadership behavior and job satisfaction. *BMC Health Services Research*, *11*(1), 98. doi:10.1186/1472-6963-11-98

Twomey, A. (2004). Web-based teaching in nursing: lessons from the literature. *Nurse Education Today*, *24*(6), 452–458. doi:10.1016/j.nedt.2004.04.010

Twycross, A., & Shields, L. (2004). Validity and reliability – What's it all about? Part 1: Validity in quantitative studies. *Paediatric Nursing*, *16*(9), 28. doi.org/10.7748/paed2004.11.16.9.28.c954

Udo, G. J., Bagchi, K. K., & Kirs, P. J. (2011). Using SERVQUAL to assess the quality of e-learning experience. *Computers in Human Behavior*, *27*(3), 1272–1283. doi:10.1016/j.chb.2011.01.009

University of Southampton. (2011/2012). University calendar 2011/12, section IV: Research data management policy. Retrieved from http://www.calendar.soton.ac.uk/arch2011_12/sectionIV/research-data-management.html

Vermunt, J. D., & Endedijk, M. D. (2011). Patterns in teacher learning in different phases of the professional career. *Learning and Individual Differences*, *21*(3), 294–302. doi:10.1016/j.lindif.2010.11.019

Vighnarajah, Luan, W. S., & Bakar, K. A. (2008). The shift in the role of teachers in the learning process. *European Journal of Social Sciences*, *7*(2), 33–41. Retrieved from http://maaz.ihmc.us/rid=1N5QX84SV-7QN025-329W/Vighnarajah The shift in the role of teachers.pdf

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Walker, R., Voce, J., & Ahmed, J. (2012). *Survey of technology enhanced learning for higher education in the UK*. Oxford: UCISA, University of Oxford.

Walker, R., Voce, J., Nicholls, J., Swift, E., Ahmed, J., Horrigan, S., & Vincent, P. (2014). *2014 Survey of technology enhanced learning for higher education in the UK*. Oxford: UCISA, University of Oxford.

Wanat, C. L. (2008). Getting past the gatekeepers: Differences between access and cooperation in public school research. *Field Methods*, *20*(2), 191–208. doi:10.1177/1525822X07313811

Watts, J. H. (2008). Challenges of supervising part-time PhD students: towards student-centred practice. *Teaching in Higher Education*, *13*(3), 369–373. doi:10.1080/13562510802045402

Weaver, K., & Olsen, J. K. (2006). Understanding paradigms used for nursing research. *Journal of Advanced Nursing*, *53*(4), 459–469. doi:10.1111/j.1365-2648.2006.03740.x

Webster, J., & Hackley, P. (1977). Effectiveness in technology-mediated distance learning. *The Academy of Management Journal*, *40*(6), 1282–1309.

Westberry, N., McNaughton, S., Billot, J., & Gaeta, H. (2014). Resituation or resistance? Higher education teachers' adaptations to technological change. *Technology, Pedagogy and Education*, (February 2015), 37–41. doi: 10.1080/1475939X.2013.869509

White, S. (2007). Critical success factors for e-learning and institutional change-some organisational perspectives on campus-wide e-learning. *British Journal of Educational Technology*, *38*(5), 840–850. doi:10.1111/j.1467-8535.2007.00760.x

Wilkinson, A., Forbes, A., Bloomfield, J., & Fincham Gee, C. (2004). An exploration of four web-based open and flexible learning modules in post-registration nurse education. *International Journal of Nursing Studies*, *41*(4), 411–24. doi:10.1016/j.ijnurstu.2003.11.001

World Medical Association. (2008). Declaration of Helsinki: Ethical principles for medical research involving human subjects. Retrieved from http://www.wma.net/en/30publications/10policies/b3/17c.pdf

Yin, R. K. (2013). *Case study research: Design and methods* (5th ed.). Thousand Oaks, CA: Sage Publications.

Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, *9*(2), 79–94. Retrieved from http://www.tqmp.org/Content/vol09-2/p079/p079.pdf

Yuan, L., & Powell, S. (2013). *MOOCs and open education: Implications for higher education*. Bolton. Retrieved from http://publications.cetis.ac.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf\nhttp://publications.cetis.ac.uk/2013/667\nhttp://www.smarthighered.com/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf

Yuen, S. C., Yaoyuneyong, G., & Yuen, P. K. (2011). Perceptions, interest, and use: Teachers and web 2.0 tools in education. *International Journal of Technology in Teaching and Learning*, *7*(2), 109–123. Retrieved from http://www.sicet.org/journals/ijttl/issue1102/2_Yuen.pdf

Zywno, M. S. (2003). A contribution to validation of score meaning for Felder - Soloman's index of learning styles. In *American Society for Engineering Education Annual Conference & Exposition*. Retrieved from http://www4.ncsu.edu/unity/lockers/users/f/felder/public/ILSdir/Zywno_Validation_Study.pdf

Zywno, M. S., & Waalen, J. K. (2002). The effect of individual learning styles on student outcomes in technology-enabled education. *Global Journal of Engineering Education*, *6*(1), 35–44. Retrieved from http://www.wiete.com.au/journals/GJEE/Publish/vol6no1/Zywno.pdf

APPENDICES

Contents

Appendix A: Literature Searches

Table 1: Interface EBSCO HOST/Search screen:_Advanced Search.

Databases: Informaworld; Ingentaconnect; Science Direct and Wiley Interscience

Search No.	Key Terms	Search modes	Hits 2008-11	Hits 2011-14
S1	Nurse education and technology	Search modes - Boolean/Phrase	74	458
S2	Nurse education and electronic learning	Search modes - Boolean/Phrase	15	251
S3	Electronic learning and staff training	Search modes - Boolean/Phrase	2	14
S4	Electronic learning and staff competence	Search modes - Boolean/Phrase	6	15
S5	Electronic learning and staff development	Search modes - Boolean/Phrase	483	1028
S6	Technology and staff development	Search modes - Boolean/Phrase	1025	3178
S7	Education and technology and staff support	Search modes - Boolean/Phrase	89	2444
S8	S1 and S6	Search modes - Boolean/Phrase	52	203
S9	S1 and S5	Search modes - Boolean/Phrase	28	250
S10	S2 and S7	Search modes - Boolean/Phrase	13	250

Table 2: Interface EBSCO HOST/Search Screen_Advanced Search.

Database CINAHL

Search No.	Key Terms	Search modes	Hits 2008-11	Hits 2011-14
S1	Online education	Search modes - Boolean/Phrase	81	81
S2	Online education and staff experience or staff perception	Search modes - Boolean/Phrase	110	29
S3	Online education and academic staff	Search modes - Boolean/Phrase	0	42
S4	Online education and academic staff	Search modes - SmartText Searching	2	17
S5	Online education and teacher training	Search modes - Boolean/Phrase	0	1
S6	Online education and teacher training	Search modes - SmartText Searching	1	23
S7	Nurse teachers and online education	Search modes - Boolean/Phrase	0	4
S8	Nurse teachers and online education	Search modes - SmartText Searching	0	107
S9	Technology enhanced education and academic staff	Search modes - Boolean/Phrase	0	7
S10	Technology enhanced education and academic staff	Search modes - SmartText Searching	4	19
S11	Teaching the teachers	Search modes - Boolean/Phrase	360	135
S12	Technology enhanced learning	Search modes - Boolean/Phrase	12	16
S13	Nurse education	Search modes - Boolean/Phrase	4973	3633
S14	S1 and S11	Search modes - Boolean/Phrase	0	113
S15	S1 and S11	Search modes - SmartText Searching	0	99
S16	S11 and S13	Search modes - Boolean/Phrase	12	25
S17	S12 and S13	Search modes - Boolean/Phrase	0	1
S18	S12 and S13	Search modes - SmartText Searching	0	0
S19	Nurse education and technology	Search modes - Boolean/Phrase	138	797

S20	Nurse education and technology and staff support	Search modes - Boolean/Phrase	0	220
S21	Nurse education and technology and staff support	Search modes - SmartText Searching	0	200
S22	Nurse education and technology and staff competence	Search modes - Boolean/Phrase	0	42
S23	Nurse education and technology and staff competence	Search modes - SmartText Searching	0	20
S24	Nurse education and staff training	Search modes - Boolean/Phrase	8	122
S25	S1 and S24	Search modes - Boolean/Phrase	3	8
S26	Technology and staff development	Search modes - Boolean/Phrase	451	560
S27	S13 and S26	Search modes - Boolean/Phrase	10	46
S28	Electronic learning and lecturer	Search modes - Boolean/Phrase	7	17
S29	Electronic learning and staff development	Search modes - Boolean/Phrase	2	37
S30	Electronic learning and staff competence	Search modes - Boolean/Phrase	0	3
S31	Electronic learning and staff competence	Search modes - SmartText Searching	0	4
S32	Electronic learning and staff training	Search modes - Boolean/Phrase	0	10
S33	Electronic learning and staff training	Search modes - SmartText Searching	2	20
S34	Challenges and web based learning	Search modes - Boolean/Phrase	8	65
S35	Higher Education	Search modes - Boolean/Phrase	8749	5542
S36	S2 and S35	Search modes - Boolean/Phrase	77	22
S37	S19 and S35	Search modes - Boolean/Phrase	38	129
S38	S35 and S36	Search modes - Boolean/Phrase		16
S39	S25 and S35	Search modes - Boolean/Phrase		5
S40	S26 and S35	Search modes - Boolean/Phrase		2

Table 3: ERIC data base searches March 2011, March 2014

Key words: Teacher, perception, online learning, technologies; Nurse, computer, education.

No	Database	Search term	Hits	2011 - 2014
S1	Australian Education Index 1979 to 2008	Technology and teacher	832	
S2	British Education Index 1975 to 2008	Technology and teacher	66	
S3	ERIC 1966 to 2008	Technology and teacher	711	769
S4	Australian Education Index 1979 to 2008	Nurse and Computer and Education	54	
S5	British Education Index 1975 to 2008	Nurse and Computer and Education	43	
S6	ERIC 1966 to 2008	Nurse and Computer and Education	211	35
S7	Australian Education Index 1979 to 2008	Self-efficacy and Culture and Values and Perception and Teacher	27	
S8	British Education Index 1975 to 2008	Self-efficacy and Culture and Values and Perception and Teacher	11	
S9	ERIC 1966 to 2008	Self-efficacy and Culture and Values and Perception and Teacher	198	3
S10	Australian Education Index 1979 to 2008	S1 and S4 and S7	20	
S11	British Education Index 1975 to 2008	S2 and S5 and S8	4	
S12	ERIC 1966 to 2008	S3 and S6 and S9	6	0

Appendix B: Systematic Literature Review presented using an adapted version of Savage and Callery's Grid (2000)

Author(s)/ date	Aim(s)	Approach/ Methodology	Sample	Relevant/ key findings
Ajjan & Hartshorne (2008) USA	An investigation of faculty decisions to adopt web 2.0 technologies	Quantitative Survey	136 faculty members in one university	Findings suggest that faculty attitude and their perceived behavioral control are strong predictors to their intention to use Web 2.0 Limitations: only one university, only web 2.0 technologies included.
An & Williams (2010) USA	This study sought to provide a synthesis of key lessons that university instructors, referred to as "Web 2.0 experts", have learned from their various experiences in teaching with these tools.	Quantitative Online Survey	14 university lecturers	Instead of maximizing the benefits of Web 2.0, educators often do the same thing with a new tool much like early distance education instructors who simply moved their course content to the Web without adapting the course and teaching methods to the new environment. Limitations: small sample, only web 2.0 technologies included.
Barbeite & Weiss (2004) USA	The study measured computer self-efficacy and levels of anxiety when using the computer.	Quantitative Online Survey	612 members of a standing research panel	The paper confirmed that anxiety associated with computer use was a significant predictor of self-efficacy for online engagement. Strengths: robust sample size; validated association Limitation: non-academic population.
Bennett et al (2012) Australia	In-depth study which evaluated six web 2.0 technologies.	Qualitative Case studies across three universities	All students in three universities undertook exercises which included wiki based exercises	Mixed findings revealed some implementations were more successful than others. Benefits – web 2.0 student content creation and sharing. Disadvantages – students unfamiliar with tools and lack of institutional support. Tension between web 2.0 and educational practices.
Blake (2009) UK	To determine the attitudes towards, and the impact of eLearning on academic staff.	Quantitative Survey	258 university lecturers representing Nursing and Midwifery from one HEI.	Findings suggest that 32.4% lacked confidence in engaging with online learning; 32.4% raised issues based around lack of time, resources and support.

				Strengths: academic (nursing and midwifery) staff, robust sample size Limitation: Reliability and validity not stated.
Bond & Goodchild (2013) UK	To examine current key debates on learning technologies in the everyday life of lecturers and explores their experiences of learning technologies.	Mixed method ethnographic approach – unstructured interviews, observation	30 HE academics interviewed/ online forum	The study revealed that all academics saw a need or use for technology in their teaching practice in some form, with internet-mediated learning and technology in classrooms of prime concern. Despite being aware of this need to engage with technology in order to enhance the quality of students' learning experiences, the findings also highlight inhibiting factors for lecturers as they strive to meet the challenges that technology can bring.
Bury et al (2006) UK	This study explored how academics, health information professionals and learning technologists developed supported online learning to explicitly address the e-literacy and information needs of health students within the context of NHS frameworks for education.	Qualitative Case study; Three short, semi- structured interviews were conducted with the aim of describing the differing perceptions of the development and support of e-learning	267 Students accessed elearning exercises. Three members of staff interviewed.	Feedback and evaluation from the student projects demonstrate that health students and health professionals—at different stages in their careers and professional education—are on the whole happy to engage with e-learning. Health information professionals within the university context do have a key role to play in e-learning development. Limitations: one university. Staff involvement only included one academic
Canrinus et al (2012) Netherlands	An investigation to determine relationships between relevant indicators of teachers' sense of professional identity (job satisfaction, occupational commitment, self-efficacy and change in level of motivation).	Quantitative Online Survey	1214 teachers in secondary education	Classroom self-efficacy and relationship satisfaction play a key influencing role in the relationships between the indicators - job satisfaction, occupational commitment, self-efficacy and change in level of motivation
Chen et al (2008) China	This study develops an instrument to assess the quality of a web-based	Quantitative Survey	154 nurses	The research results show that all indicators of the instrument provide a fit to the quality

	learning system for nurses' continuing education based on the quality dimensions of a mature information systems success model.			measurement of a web-based learning system and have high reliability and validity. Limitations: bias introduced through self-selected sample, respondents could have completed numerous surveys.
Chinyio & Morton (2006) UK	An investigation into the effectiveness of elearning	Qualitative and quantitative Case study Survey	36 academics; 338 students	The findings of staff and student surveys, firstly indicate that e-learning efficiently facilitates information transfer. Some learners (and, indeed, staff) are reported to be timid or unenthusiastic about learning via technology and will need to be motivated to embrace it. Limitation: one university
Dray et al (2011) USA	This study involved a three-phase approach to validate a survey measuring students' readiness for online learning.	Quantitative Survey	501 undergraduate and graduate students	The research suggest that students were responding to questions on the basis of their personal life experiences in general rather than within the educational context of online learning. They recommend other important factors for consideration in future studies i.e., student' engagement with ICT, rather than access to technology. Limited by the results reported in this study.
Frith & Kee (2003) USA	This study compared the effectiveness of different instructional communication methods in a Web-based course on students' cognitive learning, satisfaction, and motivation to complete the course.	Quantitative A post-test only, control group experimental design.	174 undergraduate nursing students	No significant group differences were found for cognitive learning or motivation to complete the course. A significant group difference was found for student satisfaction with the course, indicating carefully planned communication strategies can improve satisfaction. Limitation: research design.
Furnham et al (1999) UK	To determine if job satisfaction and work values affect motivation.	Quantitative Survey	92 job applicants	This study establishes a positive correlation between job satisfaction, motivation and work values. Strength: Positive correlation validated Limitations: Non-academic population.

Gattiker & Hlavka (1992) Canada	To investigate whether attitudes to computers, play a part in determining learning performance.	Quantitative Survey	156 university students who attended a 'hands on' classroom computer session.	The researchers suggest a cautious 'yes' in determining a relationship between attitudes to computers and learning which they suggest requires further testing. Strength: Validated relationship which encourages further testing
Gilbert (2011) USA	To measure levels of enthusiasm when engaging with new technologies using the concepts from Rogers Diffusion Theory.	Quantitative Online Survey	525 staff members.	The findings indicate that staff are predominantly within the early majority category (43%). Limitations: Reliability was not estimated for the single-item scale question. Strength: Utilisation of Rogers classification.
Hemmings et al (2012) Australia	An investigation to assess the self-efficacy of lecturing staff with respect to research, teaching and service.	Quantitative Survey	132 lecturers across two universities	The findings suggest that interventions could be designed to strengthen self-efficacy. Since mastery experiences are the most influential source of self-efficacy, these interventions should focus on this form of experience. As mentoring and tailored workshops with peer modelling have also been reported to have reasonable success in raising self-confidence, it would seem that an effective intervention may require these components.
Johnson (2008) USA	To explore the experiences of faculty members in a graduate nursing program and their reflections on the transition from face-to-face instruction to teaching in an online environment.	Qualitative Phenomenological study. Guided interview with 12 open-ended questions.	12 faculty members.	Nurse faculty members who make the transition to web-based instruction, experience considerable change in their role and teaching responsibilities. Most of the participants in this study, did not feel adequately prepared to teach in the online setting.
Jones & Dexter (2014) USA	An exploration of how teachers learn: the roles of formal, informal and independent learning in professional development activities.	Qualitative Focus groups	Not clear; possibly between 36-40	Overall, teachers indicated that formal professional development was beneficial. Large training sessions provided by technology integrators to provide instruction for new were all viewed as efficient uses of resources.

Joo et al (2000) Korea	To measure perceived internet efficacy and its effect on student motivation and performance in web-based learning.	Quantitative Survey	152 college students undertaking science classes	The findings demonstrated a positive correlation between engagement with computers and student motivation.
Kember (1997) International	To re-conceptualise Academics' conceptions of teaching.	Qualitative Systematic action research review of 13 studies involving qualitative interviews of academics representing various subject areas in HEIs.	466 academics	Five themes were identified from which a model of teaching approaches emerged which correlate to student learning. Limitation: The research was conducted prior to the emergence of online teaching and learning.
Kopcha (2012) USA	To examine the effect of sustained and situated professional development on teachers' perceptions of the common barriers to technology integration and their instructional practices with technology.	Quantitative Survey Case study: examination of teacher perceptions. Qualitative Observation of teaching practices; interviews.	18 school teachers	The results suggest that enacting a variety of situated learning activities around the principles of effective professional development may be the key to providing teachers with the knowledge and support needed to integrate technology more fully into their instruction. Examining the relationship between such activity and teachers' long-term practices with technology is a critical first step in making lasting changes in the way teachers use technology to support student learning in the classroom. Limitation: small sample size
Litzinger et al (2007) USA	To assess reliability and construct validity of the Index of Learning Styles (LSI) dimensions.	Quantitative Survey	1000 undergraduate students on a pre-teaching course;	Reliability and Validity assured.
Moule et al (2010) UK	Experiences and use of elearning in higher education	Mixed method. Quantitative Survey (Postal and online questionnaires administered) 25 HEIs – 9 case study sites Student focus group Staff interviews	41 nursing and healthcare students 35 staff	Analysis of student responses presented as three emerging themes: pedagogic use; factors inhibiting use; and, facilitating factors to engagement.

McGill & Hobbs (2007) Australia	To directly compare the use of and perceptions of VLEs.	Quantitative Online Survey	All students enrolled in 17 different undergraduate degrees, and academics on an email list comprising users of Web CT.	The findings suggest that students considered the VLE to have a better task-technology fit for their activities than did the instructors (mean 69.37 vs 55.07). The study stressed that the successful integration of technology into teaching is very much dependent on how instructors embrace and use it.
McGugan & Peacock (2005) UK	To explore learning technology and its potential to support student placements in hospitality and tourism education	Action research Students: questionnaire plus observation in placement Tutors: interviews	30 students 11 tutors	The findings indicate that students and placement tutors view the development of this support positively, and VLEs are considered to be useful tools that can supplement (rather than replace) existing practices. However, in the course of the study it became evident that the full potential of these tools to support learning was not being fully realised. Similarly from a tutor perspective, lack of appreciation and experience in the use of the VLE as a tool to enhance learning is an issue.
Owens (2012) UK	Facilitating learning or transmitting knowledge: The nature of teaching practices when using this technology and to determine whether this practice is aligned with teachers' pedagogical beliefs	Quantitative Online Survey	529 university lecturers	The survey found a considerable difference between university lecturers' reported pedagogical beliefs and their actual practices when teaching online
Paechter et al (2010) Austria	An investigation of how students' expectations of e-learning courses, i.e., important and desirable characteristics of a course, and their experiences in an e-learning course relate to learning achievements and course satisfaction.	Qualitative Pilot: online interviews. Quantitative main study: Survey	446 students	The results present two aspects which contribute strongly to learning, namely achievements and course satisfaction. Students who considered gains in competencies as especially important, experienced higher achievements. Instructor's expertise and role as a counselor and facilitator in learning is emphasised. The instructor does not become less important in e-

				learning. Students experience the instructor's support and expertise as especially important for the acquisition of knowledge, skills, and competences and for course satisfaction.
Pajo & Wallace (2001) New Zealand	To examine current use of web-based technologies, future intentions to use such technologies and identify major barriers to the uptake of the technology.	Quantitative A paper based postal Survey	719 university academics	The findings suggest 21% of staff were reluctant to adopt new technologies, with 12% not perceiving them to be useful. Limitation: Reliability not estimated for single-item scale questions.
Parpala et al (2010) Finland	To explore students' approaches to learning and their experiences of the teaching-learning environment in different disciplines.	Quantitative Online Survey	2509 students from 11 universities;	The results of the study indicate that approaches to learning and the study discipline have an affect on students' experiences of the teaching–learning environment. Limitation: more research is needed in order to enhance understanding of the complex relationship among approaches to learning, the various disciplines, and experiences of the teaching–learning environment.
Postareff et al (2008) Finland	To explore consonance and dissonance in the kinds of combinations of approaches to teaching that university teachers adopt.	Mixed: Qualitative/Quantitative, the former being more dominant. Semi-structured interviews. Teaching inventory questionnaire completed shortly before or after the interview.	97 teachers	Classification of university teachers' teaching profiles
Premkumar et al (2010) Canada	To identify the feasibility of repurposing specific online modules, Specifically, relevancy of the content, quality of online material, time-effectiveness of using the online component,	Evaluation study Qualitative semi-structured interviews Quantitative Survey	58 medical students	The study found that instructors felt that the content of the modules was appropriate and would enhance learning, although making changes was time consuming. Medical students reported that the content was relevant and they enjoyed the flexibility allowed by the online components.

	required resources, and student satisfaction were investigated			
Rovai (2002) USA	To develop and field-test the Classroom Community scale. This scale measure sense of community (Connectedness & Learning) in a learning environment.	Quantitative Online Survey	375 graduate students enrolled in 28 online courses.	The scale was found to be a valid measure which had high internal consistency in relation to connectedness and learning. The researchers suggest the scale can be administered to other populations.
Salinas (2008) USA	A study to explore 'why does faculty shy away from the use of instructional technology in the classroom?'	Action research case study	36 undergraduate students	The results suggest how training the teachers-facilitators to manage both the new classroom and the new technology should be implemented.
Simosi (2012) Greece	A study to examine the role that self-efficacy and organizational culture play in relation to training transfer.	Quantitative Survey (hand distributed)	252 public sector employees in training	The findings suggest a relationship between self-efficacy and training transfer.
Saeed et al (2009) Australia	To collect student's learning styles and technology preferences for emerging web technologies.	Quantitative Online Survey	204 university students nearing completion of either a bachelors or Masters IT degree.	This paper confirmed the correlation that technology preferences' are influenced by learners' learning style. The researchers suggest that the outcome can serve as a guideline for lecturers when choosing the right technology for the right audience in their courses.
Sun et al (2008) China	A study to assess eLearning effects through measuring learner satisfaction and investigate the preceding factors' influences on satisfaction.	Quantitative Survey	295 eLearning university students	The results revealed that learner computer anxiety, instructor attitude toward eLearning, e-Learning course flexibility, e-Learning course quality, perceived usefulness, perceived ease of use, and diversity in assessments are the critical factors affecting learners' perceived satisfaction.

Thorpe & Edmunds (2011) UK	A study of part-time student experience of university courses delivered using a range of technologies.	Qualitative Interview	30 students	Higher education that can be enhanced by appropriate use of technology. However, this is itself contingent on the imagination educators bring to the design of learning activities and is by no means guaranteed.
Tsai (2011) China	An examination of relationships between organizational culture, leadership behavior and job satisfaction.	Quantitative Survey	200 hospital nurses	The findings revealed that organizational cultures were significantly (positively) correlated with leadership behavior and job satisfaction, and leadership behavior was significantly (positively) correlated with job satisfaction.
Udo et al (2011) USA	A study to assess the quality of elearning experience.	Quantitative Survey	203 eLearning students	The study found that Assurance, Empathy, Responsiveness, and Website Content play a significant role in perceived e-learning quality, which in turn affects learners' satisfaction and future intentions to enroll in online courses.

Appendix C.i: Previous research highlighting the factors that affect engagement with technology enhanced learning: Student population

Author(s)	Data source	Aim	Reliability	Results
Litzinger, TA., Lee, SH., Wise, JC., and Felder R.M. 2007* USA	An online questionnaire administered to 1000 undergraduate students on a pre-teaching course; students represent engineering, liberal arts and education.	To assess reliability and construct validity of the Index of Learning Styles (LSI) dimensions: Active/Reflector; Sensing/Intuitive Visual/Verbal Sequential/Global	Cronbach's Alpha 0.61 0.76 0.75 0.55	In this study 586 students completed (62.8% response rate); reliability estimate of the scores for the four scales of the ILS based on Cronbach's alphas were confirmed (range 0.56 to 0.77). Validity is strong: changing the instrument would be ill-advised.
Gattiker,U.E., and Hlavka, A. 1992 Canada	A paper questionnaire administered to 156 university students who attended a 'hands on' classroom computer session.	To investigate whether attitudes to computers, play a part in determining learning performance.	Cronbach's Alpha 0.79 0.76	In this study missing students not stated. Participation >70%. The researchers suggest a cautious 'yes' in determining a relationship between attitudes to computers and learning which they suggest requires further testing.
Joo,Y-J., Bong,M.,and Choi,H-J. 2000 Korea	An unspecified questionnaire administered to 152 college students undertaking science classes	To measure perceived internet efficacy and its effect on student motivation and performance in web-based learning.	Cronbach's Alpha 0.95	152 students took part in this research. The findings demonstrated a positive correlation between engagement with computers and student motivation.
Rovai, A.P 2002 Internet and Higher Education USA	An online questionnaire administered to 375 graduate students enrolled in 28 online courses.	To develop and field-test the Classroom Community scale. This scale measure sense of community (Connectedness & Learning) in a learning environment.	Cronbach's Alpha 0.92 0.87	In this study 375 students completed (66% response rate); The scale was found to be a valid measure which had high internal consistency in relation to connectedness and learning. The researchers suggest the scale can be administered to other populations.
Saeed, N., Yang,Y., and Sinnappan S 2009 Australia	An online questionnaire administered to 204 university students nearing completion of either a bachelors or Masters IT degree.	To collect student's learning styles and technology preferences for emerging web technologies.	* Learning styles data was gathered using Felder- Soloman's (1993) learning style inventory (LSI).	This paper confirms the correlation that technology preferences' are influenced by learners' learning style. The researchers suggest that the outcome can serve as a guideline for lecturers when choosing the right technology for the right audience in their courses.

Appendix C.ii: Previous research highlighting the factors that affect engagement with technology enhanced learning: Non-academic population

Author(s)	Data source	Aims	Reliability	Results
Barbeite F.G. and Weiss, E.M 2004 USA	An online questionnaire administered to a random sample of 612 members of a standing research panel from an available population of 4100.	The study measured people's computer self-efficacy and levels of anxiety when using the computer.	Cronbach's Alpha 0.76	In this study 226 completed (response rate 43%). The paper confirmed that anxiety associated with computer use was a significant predictor of self-efficacy for online engagement. Limitations: non-academic population.
Furnham, A., Forde, L., and Ferrari, K. 1999 UK	An unspecified questionnaire administered to 92 job applicants for middle management posts.	To determine if job satisfaction and work values affect motivation.	Cronbach's Alpha Job satisfaction 0.70 Work motivation 0.76	In this study all 92 applicants completed. This study establishes a positive correlation between job satisfaction, motivation and work values. Limitations: non-academic population.

Appendix C.iii: Previous research highlighting the factors that affect engagement with technology enhanced learning: Academic population

Author(s)	Data source	Aims	Reliability	Results
Blake, H. 2009 UK Joint Information Systems Committee [JISC] and the Universities and Colleges Information Systems Association [UCISA] 2003	An unspecified questionnaire administered to 258 university lecturers representing Nursing and Midwifery from one HEI.	To determine the attitudes towards, and the impact of eLearning on academic staff.	Questions based on previous research developed in collaboration with e-learning experts with Centre for Excellence in Teaching and Learning in Reusable Learning Objects (CETL-RLO) – content validity stated as being demonstrated.	In this study 102 lecturers completed (40% response rate). Findings suggest that 32.4% lacked confidence in engaging with online learning; 32.4% raised issues based around lack of time, resources and support. Limitations: Reliability and validity not stated.
Gilbert, L. 2011 USA	An online questionnaire administered to a random unspecified sample of 525 staff members.	To measure levels of enthusiasm when engaging with new technologies using the concepts from Rogers Diffusion Theory.	Individual adoption rates of innovation are distributed along a bell shaped curve and can be grouped under five categories: innovators; early adopters; early majority; late majority, and laggards.	In this study 129 completed (response rate 25%). The findings indicate that staff are predominantly within the early majority category (43%). Limitations: Reliability was not estimated for the single-item scale question.
Kember, D. 1997 International	Systematic action research review of 13 studies involving qualitative interviews of	To re-conceptualise Academics' conceptions of teaching.	Imparting information. Transmitting structured knowledge. Teacher-student interaction. Facilitating understanding.	In this study 466 academics participated in qualitative interviews. Five themes were identified from which a model of teaching approaches emerged

	academics representing various subject areas in HEIs.		Conceptual change and intellectual development.	which correlate to student learning. Limitations: The research was conducted prior to the emergence of online teaching and learning.
McGill, T., and Hobbs, V. 2007 Australia	An online questionnaire administered to all students enrolled in 17 different undergraduate degrees, and all academics on an email list comprising users of Web CT.	To directly compare the use of and perceptions of VLEs.	Cronbach's Alpha Task-technology fit: Overall reliability 0.78	In this study 67 university lecturers and 267 students completed (response rate not known). The findings suggest that students considered the VLE to have a better task-technology fit for their activities than did the instructors (mean 69.37 vs 55.07). The study stressed that the successful integration of technology into teaching is very much dependent on how instructors embrace and use it.
Pajo K., and Wallace, C. 2001 New Zealand	A paper based postal questionnaire distributed to 719 university academics representing Business, Science and Education.	To examine current use of web-based technologies, future intentions to use such technologies and identify major barriers to the uptake of the technology.	Cronbach' s Alpha for factor scales ranged from 0.76 – 0.84.	In this study 180 completed (response rate 34.8%). The findings suggest 21% of staff were reluctant to adopt new technologies, with 12% not perceiving them to be useful. Limitations: Reliability not estimated for single- item scale questions.

Appendix D: Pilot study data collection instrument

Becoming an online course developer: experiences and perceptions of lectures

Pilot Study

The survey consists of six sections of short open and closed questions, each of which considers your experiences and perceptions of Technology Enhanced Learning (TEL). The questions ask about the factors that may influence your engagement with TEL and include sections on demography, your preferred teaching method, your perception of VLEs, the culture of your organisation as it relates to TEL, and finally what motivates you at work – included in this final section is the opportunity for you to review your individual learning style. You will then be given the opportunity to discuss and explore your answers by talking directly to the researcher, Jenny Jepson, via Skype, telephone or email. In total it should take you approximately 15 minutes to complete. If you start the survey and wish to return to it later (which includes exiting from the survey site), please click the 'SAVE AND CONTINUE' button at the bottom of the page you are on, this will then allow you to return to the point at which you left by using the hyperlink on the email you received.

On completion of the pilot study you will be directed to a very short questionnaire which has been designed to measure the content and face validity of this data collection tool. I have sent you a copy of the post-questionnaire survey as a 'Word' document so that you can review the type of questions I am asking you as you fill in the pilot study questions. Kindly provide your responses using the electronic version.

When you have completely filled out the form please click on the 'Submit' button at the end of the survey.

Section 1: Engagement with Technology Enhanced Learning.

Technology Enhanced Learning refers to the enhancement of existing and new learning experiences through the utilisation of one or more technologies.

*Please choose only **one** to answer in this section.*

1. In considering your role with Technology Enhanced Learning you would say that you are…

a) Fully engaged with no support ☐

b) Fully engaged with minimal support ☐

c) Engaged but requiring extensive support ☐

d) Engaged but not actively contributing ☐

e) Part of a module (development) team but not engaged in any way ☐

Save and continue

Section 2: Demography & Background information.

*Choose only **one** answer in Question 2.1. Answer **each** section in Questions 2.2 and 2.3.*

2.1 **Years of service**:

How many years of experience do you have in higher education learning and teaching?

☐ ~2 years ☐ 2- 5 years ☐ 6 – 9 years ☐ 10 – 14 years ☐ > 15 years

2.2 **Computer skill**.

Would you say that working with computers …

i) is very difficult

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ii) is very complicated

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iii) requires technical ability

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iv) creates psychological stress

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

v) can only be done if one has been trained

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vi) is only advisable for people with a lot of patience

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vii) makes a person more productive at his/her job

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

viii) is for young people only

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and continue

2.3 **Computer exposure**:

Which web technologies do you use to support your online teaching …

i) Blog

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ii) Wiki

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iii) Podcast

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iv) Lecture capture i.e. Panopto

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

v) Adobe Connect

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vi) Photographs

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vii) RSS (Really Simple Syndication) feeds

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

viii) Twitter

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ix) Video/Videocasts

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

x) Skype

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and continue

Section 3: Preferred Face to Face Teaching Method

*Please **rank** your preferences – 1 indicates your strongest preference whilst 5 is your least preferred approach.*

3.1 Teaching in Higher Education: I want to know which of the following is your preferred approach to teaching …

My preferred approach to teaching is

-	⮟

LECTURE -Teaching as imparting information (teacher centred/student passive recipient

-	⮟

PROBLEM SOLVING -Teaching as transmitting structured knowledge (teacher centred/student recipient

-	⮟

GROUP DISCUSSION -Teaching as an interaction between the teacher and the student (teaching interactive/student participation

-	⮟

PROBLEM BASED LEARNING -Teaching as facilitating understanding on the part of the student (student centred/teacher facilitates/student constructs knowledge within teacher's framework

-	⮟

ENQUIRY BASED LEARNING -Teaching as bringing about conceptual change and intellectual development in the student (student centred/teacher acts as a change agent/developer/student develops by constructing meaning –)

Save and continue

Section 4: Participants' perception of Virtual Learning Environments

Please answer each of the sections in Questions 4.1, 4.2, 4.3 and 4.5.

Choose only one answer in Question 4.4 and Question 4.6.

4.1 Anticipated consequences of use: I want to know if you would say that …

i) Working with a computer would make me very nervous

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ii) I get a sinking feeling when I think of trying to use a computer

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iii) Computers make me feel uncomfortable

Strongly disagree< ---------- Strongly agree >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

iv) Computers make me feel uneasy and confused

Strongly disagree< ---------- Strongly agree >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

4.2 Utilisation: I want to know if you feel confident …

i) Starting an internet search engine i.e. Internet Explorer, Google, Mozilla Firefox

Not at all confident< ---------- Totally confident >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

ii) Connecting to the internet homepage that I want i.e. Internet Explorer, Mozilla Firefox

Not at all confident< ---------- Totally confident >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

iii) Downloading and saving files e.g. pdf

Not at all confident< ---------- Totally confident >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

iv) Providing hyperlinks from the internet into emails

Not at all confident< ---------- Totally confident >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

v) Finding previous pages by using the 'back' button

Not at all confident< ---------- Totally confident >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

vi) Using internet search engines such as Google, Yahoo

Not at all confident< ---------- Totally confident >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

4.3 Impact: I want to know what factors impact on any (further) development of your (or any potential) engagement with online learning over the coming years?

i) Time required to learn how to use the technology

Strongly disagree< ---------- Strongly agree >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

ii) Lack of confidence

Strongly disagree< ---------- Strongly agree >				
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

iii) Lack of incentives

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iv) Lack of enthusiasm for it

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

v) Don't want to change

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vi) Don't think it enhances student learning

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vii) Lack of academic staff development

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

viii) Lack of support staff

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ix) Current organizational structure

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

x) Technical problems/unreliable network

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xi) Too many different standards and guidelines

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xii) Too few standards and guidelines

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4.4 Attitudes towards using: I want to know which one of the following statements summarises your feelings about using VLEs

☐ I am sceptical of new web technologies and use them only when I have to

☐ I am usually one of the last people I know to use new web technologies

☐ I usually use new web technologies when most people I know do

☐ I like new web technologies and use them before most people I know

☐ I love new web technologies and am among the first to experiment and use them

4.5: Task-technology fit: I want to know in what way a Virtual Learning Environment, for example Web CT, Blackboard, supports your module delivery …

i) The VLE fits well with the way I like to work

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ii) The VLE is compatible with all aspects of my work

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iii) The VLE is easy to use

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iv) The VLE is user friendly

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

v) It is easy to get the VLE to do what I want it to do

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vi) It is easy for me to become more skilful at using the VLE

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vii) New features are easy to learn

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

viii) The output is presented in a useful format for students to understand

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ix) Materials can be easily updated

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Please identify the VLE that you regularly use (please tick all that apply)
☐ Web CT ☐ Blackboard ☐ Computer Management System ☐ SharePoint ☐
Other(s): please state in the box provided

Save and continue

Section 5: Culture of the Higher Education Institution as it relates to TEL

Please answer every questions in all of the sections.

5.1 Lecturer support: As a lecturer in health/nursing would you say that you feel …

i) That colleagues in your faculty/department care about each other

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ii) That you are encouraged to ask questions

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iii) Connected to others who are developing online courses

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iv) That it is hard to get help when you have a question

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

v) Lacking in a spirit of belonging

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vi) Uneasy about exposing gaps in your understanding

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vii) Isolated whilst developing online materials/modules/ courses

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

viii) Reluctant to speak openly

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ix) That you can rely on other members of staff to help with the development/delivery of your online module(s) of learning

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

x) That other colleagues do not help you to learn

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xi) That other members of teaching staff who teach on your module depend on you

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xii) That you are given ample opportunities to learn

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xiii) That your educational needs are not being met

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xiv) Confident that others will support you

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and continue

Section 6: Work Motivation and Learning Styles

Please answer each section within Question 6.1.

6.1 Work Motivation and Values: I would like to know your opinion as to whether your current role, provides you with …

i) Job security

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ii) Opportunity for personal growth

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iii) A fair and considerate boss (line manager)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

iv) The opportunity for you to use your ability (knowledge base)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

v) Convenient (flexible to suit you) hours of work

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vi) Recognition for doing a good job

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

vii) Job status

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

viii) Responsibility (empowerment)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

ix) Opportunity to interact with people

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

x) Achievement at work

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xi) Benefits (good holiday leave; sick leave; study leave etc.)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xii) Influence in the work place

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xiii) Co-workers (pleasant fellow workers)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xiv) Interesting work

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xv) Satisfactory pay (the amount of money you get)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xvi) Advancement (chances for promotion)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xvii) Work conditions (comfortable and clean)

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

xviii) Meaningful, important work

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and continue

6.2 Learning Styles inventory

The following questions are adapted from the INDEX OF LEARNING STYLES INVENTORY, reproduced with kind permission from Richard M. Felder and Barbara A. Soloman, *Index of Learning Styles*, http://www.ncsu.edu/felder-public/ILSpage.html, accessed 11 November 2012.

Please choose only one answer for each question. If both responses seem to apply to you, choose the one that applies more frequently. As this is a learning styles inventory you will be asked about your own learning.

You are invited to contact the researcher (see Section 7) for your Index of Learning Styles score, and feedback relating to your identified learning style.

1. I understand something better after I
   - ○ **(a)** try it out.
   - ○ **(b)** think it through.
2. I would rather be considered
   - ○ **(a)** realistic.
   - ○ **(b)** innovative.
3. When I think about what I did yesterday, I am most likely to get
   - ○ **(a)** a picture.
   - ○ **(b)** words.

4. I tend to
   - **(a)** understand details of a subject but may be fuzzy about its overall structure.
   - **(b)** understand the overall structure but may be fuzzy about details.
5. When I am learning something new, it helps me to
   - **(a)** talk about it.
   - **(b)** think about it.
6. As a teacher, I would rather teach a course
   - **(a)** that deals with facts and real life situations.
   - **(b)** that deals with ideas and theories.
7. I prefer to get new information in
   - **(a)** pictures, diagrams, graphs, or maps.
   - **(b)** written directions or verbal information.
8. Once I understand
   - **(a)** all the parts, I understand the whole thing.
   - **(b)** the whole thing, I see how the parts fit.
9. In a study group working on difficult material, I am more likely to
   - **(a)** jump in and contribute ideas.
   - **(b)** sit back and listen.
10. I find it easier
    - **(a)** to learn facts.
    - **(b)** to learn concepts.
11. In a book with lots of pictures and charts, I am likely to
    - **(a)** look over the pictures and charts carefully.
    - **(b)** focus on the written text.
12. When I solve maths problems
    - **(a)** I usually work my way to the solutions one step at a time.
    - **(b)** I often just see the solutions but then have to struggle to figure out the steps to get to them.
13. In classes I have taken
    - **(a)** I have usually got to know many of the students.
    - **(b)** I have rarely got to know many of the students.
14. In reading non-fiction, I prefer
    - **(a)** something that teaches me new facts or tells me how to do something.
    - **(b)** something that gives me new ideas to think about.
15. I like teachers
    - **(a)** who put a lot of diagrams on the board.
    - **(b)** who spend a lot of time explaining.

16. When I'm analysing a story or a novel
    - **(a)** I think of the incidents and try to put them together to figure out the themes.
    - **(b)** I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.
17. When I start a 'homework' problem, I am more likely to
    - **(a)** start working on the solution immediately.
    - **(b)** try to fully understand the problem first.
18. I prefer the idea of
    - **(a)** certainty.
    - **(b)** theory.
19. I remember best
    - **(a)** what I see.
    - **(b)** what I hear.
20. It is more important to me that an instructor
    - **(a)** lay out the material in clear sequential steps.
    - **(b)** give me an overall picture and relate the material to other subjects.
21. I prefer to study
    - **(a)** in a study group.
    - **(b)** alone.
22. I am more likely to be considered
    - **(a)** careful about the details of my work.
    - **(b)** creative about how to do my work.
23. When I get directions to a new place, I prefer
    - **(a)** a map.
    - **(b)** written instructions.
24. I learn
    - **(a)** at a fairly regular pace. If I study hard, I'll "get it."
    - **(b)** in fits and starts. I'll be totally confused and then suddenly it all "clicks."
25. I would rather first
    - **(a)** try things out.
    - **(b)** think about how I'm going to do it.
26. When I am reading for enjoyment, I like writers to
    - **(a)** clearly say what they mean.
    - **(b)** say things in creative, interesting ways.
27. When I see a diagram or sketch in class, I am most likely to remember
    - **(a)** the picture.
    - **(b)** what the instructor said about it.

28. When considering a body of information, I am more likely to
    - **(a)** focus on details and miss the big picture.
    - **(b)** try to understand the big picture before getting into the details.
29. I more easily remember
    - **(a)** something I have done.
    - **(b)** something I have thought a lot about.
30. When I have to perform a task, I prefer to
    - **(a)** master one way of doing it.
    - **(b)** come up with new ways of doing it.
31. When someone is showing me data, I prefer
    - **(a)** charts or graphs.
    - **(b)** text summarizing the results.
32. When writing a paper, I am more likely to
    - **(a)** work on (think about or write) the beginning of the paper and progress forward.
    - **(b)** work on (think about or write) different parts of the paper and then order them.
33. When I have to work on a group project, I first want to
    - **(a)** have "group brainstorming" where everyone contributes ideas.
    - **(b)** brainstorm individually and then come together as a group to compare ideas.
34. I consider it higher praise to call someone
    - **(a)** sensible.
    - **(b)** imaginative.
35. When I meet people at a party, I am more likely to remember
    - **(a)** what they looked like.
    - **(b)** what they said about themselves.
36. When I am learning a new subject, I prefer to
    - **(a)** stay focused on that subject, learning as much about it as I can.
    - **(b)** try to make connections between that subject and related subjects.
37. I am more likely to be considered
    - **(a)** outgoing.
    - **(b)** reserved.
38. I prefer courses that emphasize
    - **(a)** concrete material (facts, data).
    - **(b)** abstract material (concepts, theories).
39. For entertainment, I would rather
    - **(a)** watch television.
    - **(b)** read a book.
40. Some teachers start their lectures with an outline of what they will cover. Such outlines are

- **(a)** somewhat helpful to me.
- **(b)** very helpful to me.

41. The idea of doing homework in groups, with one grade for the entire group,
    - **(a)** appeals to me.
    - **(b)** does not appeal to me.
42. When I am doing long calculations,
    - **(a)** I tend to repeat all my steps and check my work carefully.
    - **(b)** I find checking my work tiresome and have to force myself to do it.
43. I tend to picture places I have been
    - **(a)** easily and fairly accurately.
    - **(b)** with difficulty and without much detail.
44. When solving problems in a group, I would be more likely to
    - **(a)** think of the steps in the solution process.
    - **(b)** think of possible consequences or applications of the solution in a wide range of areas.

Section 7: Further information

If you wish to contact the researcher for further information relating to this study (including your Identified Learning Style result), or you are happy to be contacted via telephone or Skype for a brief follow up discussion, please enter your name and contact details in the box provided. Personal data will not be made available to anyone other than the researcher.

When you click on the 'Save and Finish' button you will automatically be transferred to the post-survey questionnaire. Thank you for completing this survey. Save and finish

Appendix E: Post-survey questionnaire (pilot study)

Section 1

Please tick a box or fill in the blanks to answer the questions.

1. How easy was it to understand the questions asked?

< Very difficult ----------Very easy >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

2. Please describe the reason for your answer to Question 1.

3. How much did you enjoy completing the survey?

< Not at all ---------- Very much >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

4. Please describe the reason for your answer to Question 3.

5. How would you grade the quality of the survey?

< Poor ----------Very good >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

6. Please describe the reason for your answer to Question 5.

7. How engaging was the style of the questions posed?

< Not at all ---------- Very engaging >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

8. Please describe the reason for your answer to Question 7.

9. How much did the language used help your understanding of the questions?

< Not at all ---------- Very much >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Please give your reasons:

10. List 3 things you liked most about the survey.

1.

2.

3.

11. List 3 things you liked least about the survey.

1.

2.

3.

12. Please suggest how the questions can be improved.

13. Please write down any other comments.

Section 2

For each statement, please indicate whether you:

1 – strongly disagree, 2 – disagree, 3 – neither disagree nor agree, 4 – agree, 5 – strongly agree.

	1	2	3	4	5
a. The questions were easy to answer.					
b. I did not find the structure of the questions easy to follow.					
c. I enjoyed completing the questionnaire.					
d. I felt able to answer the questions posed.					
e. I felt there was some ambiguity in the language used.					
f. The questions made me actively engage in completing the survey.					
g. The style used for the questions was engaging.					
h. The amount of questions for each section was appropriate.					
i. I found the instructions for completion confusing.					
j. The depth of questioning was appropriate.					
k. Some of the questions were hard to answer.					
l. The length of time required to complete the survey was appropriate.					
m. The content of the questions was difficult to understand.					
n. I would not like to have to complete a survey like this again.					
o. I would be very interested to see the results of the survey analysis.					

Would you like to be contacted again in relation to this research? If you are willing, please write down your name and email address.

Name: _____ / Email address: _____

Appendix F: Invitation to participate & Information sheet (Pilot Study)

Ethics Number: SFEC 2012 – 010

January 2013

Study name: Teachers' Experiences and Perceptions of the transition from traditional taught courses to an on-line (internet) environment utilising Technology Enhanced Learning (TEL).
Name of researcher: Jenny Jepson

Supervisors: Dr. Ann Dewey & Dr. Penny Delf

Dear Colleague

My name is Jenny Jepson I am a member of the teaching staff within the Faculty of Health Sciences, at the University of Southampton, I am also a student currently studying towards a Professional Doctorate in Nursing at the University of Portsmouth. I have contacted you in relation to your involvement with the development and/or delivery of online learning and teaching materials at your university. Your name has been given to me by xxxxx, Deputy Head Nursing Programmes.

I would like to invite you to take part in the piloting of my research study which aims to explore teachers' experiences and perceptions of the transition from traditional taught courses to an on-line (internet) environment utilising Technology Enhanced Learning (TEL). The reason I am asking you to be a part of the pilot is because of your university's involvement and subsequent publication of a qualitative research study (Heaton-Shrestha et al., 2005) which explored the perspectives of staff in relation to the introduction of a virtual learning environment and its impact on teaching. The aim of the pilot study is to test the survey for its acceptability. I would also like to invite you to reflect upon your experiences of completing the survey by completing an additional short post-survey questionnaire.

I attach

- An information sheet describing the study, with on-line
- Consent to participate in the pilot study, which gives direct access to the
- Survey questionnaire

Thank you for taking time to read the information attached.

Kind regards

Jenny Jepson

Professional Doctorate in Nursing Student, University of Portsmouth
Tel: 023 80 59 8264

Email: J.Jepson@soton.ac.uk
Skype: jennyjepson1

PILOT STUDY: Information sheet/Consent/on-line survey questionnaire (e-mail distribution)

Ethics Number: SFEC 2012 - 010

Study Name: Teachers' Experiences and Perceptions of the transition from traditional taught courses to an on-line (internet) environment utilising Technology Enhanced Learning (TEL).
Name of researcher: Jenny Jepson

Supervisors: Dr. Ann Dewey & Dr. Penny Delf

I would like to invite you to take part in the piloting of a research study that explores teachers' experiences and perceptions of the transition from traditional taught courses to an on-line (internet) environment utilising Technology Enhanced Learning (TEL) using an on-line survey questionnaire. I would also like you to complete a short post-survey questionnaire to measure the face and content validity of the main survey instrument and thus enhance the credibility of the study.

I have chosen your university to be a part of the pilot because of their involvement and subsequent publication of a qualitative research study (Heaton-Shrestha, Edirisingha, Burke, & Linsey, 2005) which explored the perspectives of staff in relation to the introduction of a virtual learning environment and its impact on teaching. The aim of the pilot study is to test the survey for its acceptability. Before you decide, it is important for you to understand why the research is being done and what it would involve for you.

Please consider the following information carefully and take time to decide whether or not you would like to take part. This information sheet will describe the study. At the end of the sheet you will be given the opportunity to consent to participate, your agreement will take you directly to the survey questions. Completion of the main survey should take approximately 15 minutes. Access to the post-survey questionnaire will be included at end of the main questionnaire and should not take you more than 15 – 20 minutes to complete.

Thank you for taking time to read this

What is the purpose of the study?

The purpose of this study is to explore teachers' experiences and perceptions of the transition from traditional taught courses to an on-line (internet) environment utilising Technology Enhanced Learning (TEL).

This information will be used to:-

- Investigate the potential reasons why some teachers engage whilst others do not with the processes employed to support the development of on-line learning.

- Explore teachers' perceptions of the impact of on-line learning on student

learning

- Ascertain whether relationships exist between the teachers' engagement with TEL, and computer skills and exposure: including the use of Web 2.0 technologies, motivation and individual learning style.

- Explore the relationship between the cultural environment of the educational establishment and its influence on the teacher's engagement with TEL.

- Contribute to a Professional Doctorate in Nursing for which I am studying.

How will the study be undertaken?

An online survey: Delivered to all university based faculties of nursing/health sciences within the United Kingdom, all of these Higher Education institutions deliver modules/courses to post-registration nursing and allied health professionals. The pilot study is however only taking place at your university.

Who has been invited to take part?

Teaching staff who deliver or who have developed learning and teaching materials/modules.

Who is undertaking the study?

The study is being undertaken by me; Jenny Jepson, a member of the Faculty of Health Sciences Technology Enhanced Learning Team and a Lecturer in the Faculty of Health Sciences at the University of Southampton. I am undertaking this study as part of my Professional Doctorate in Nursing research at the University of Portsmouth and not as part of my Lecturer or TEL role.

Do I have to take part in the pilot study?

No. It is up to you to decide if you want to take part or not: please click on the 'Opt out of this survey' hyperlink at the end of this information if you do not wish to participate.

What will happen if I decide to take part?

You will be asked to click on the 'Survey Link' at the end of this information sheet; read the questions carefully at the bottom of this sheet as by clicking on the hyperlink you are giving your consent to participate. You will be reminded of your consent to participate on first accessing the survey questionnaire.

Why is there no paper consent form?

A consent form is written confirmation that you agree to take part in the study, when you click 'Survey Link' you determine your consent to participate: clicking on the hyperlink will also give you access to the survey questionnaire. Your return of the completed on-line survey will affirm your agreement to take part.

What will happen if I decide not to take part?

Please click the 'Opt out of this survey' button at the end of this information. If you decide you don't want to take part in the study that is OK, you won't have to give a reason, and you will not be contacted again.

What are the benefits of taking part?

Knowing that the views and experiences you have contributed to this pilot study will enhance the credibility of the main study.

Who had reviewed the study?

The study proposal and accompanying information has been seen and approved by the School of Health Sciences and Social Work Ethics Committee at the University of Portsmouth.

What if I have a concern or complaint?

If you have a concern or a complaint about this study you should contact Dr Jason Oakley, Science Faculty Ethics Committee member at jason.oakley@port.ac.uk

Will my involvement in this study be kept strictly confidential?

Yes. The procedures for handling, processing, storage and destruction of the data comply with the 1998 Data Protection Act. This means that all information about your contact details will be kept in a secure place and separate from the information collected during the survey. On your completion of the pilot study I will not be able to attribute your responses to you; the electronic survey tool completely randomizes individual anonymity.

You may or may not know others taking part in the study, but I would respectfully ask that any information included on the survey is not discussed or shared with anyone so that your own confidentiality is maintained.

All information you share with me will be confidential and will only be seen by myself and my supervisors, at all times your identity as a participant in the study will not be known by me. There will be no individual identifiable material in the survey. On-line returns will be stored anonymously with randomly allocated anonymity of your name or anything that would identify you to me or to others. All documentation; including this initial e-mail correspondence, will be stored in a computer file that is password protected.

After the study has finished any information relating to the pilot and main study will be stored securely for 10 years and then destroyed as confidential waste in line with University of Southampton information storage policy.

What will happen to the findings of the study?

The findings of the pilot and main study will form part of my thesis and may be published in academic journals relating to nurse education and technology enhanced learning as it relates to health care professionals. The findings from the pilot study will be analysed in isolation from the main study and will not form part of the overall study analysis and results. The reason for this is that you and your colleagues may identify significant areas requiring

attention and change which could contaminate the main study if included. Please be reassured that no participants will be identified in any publications and seminars.

What do I do if I am interested in taking part or would like further information?

If you think you would like to take part in this study but would first like to talk to me, my contact number is: 023 80 59 8264, my Skype details are jennyjepson1 and my email address is: J.Jepson@soton.ac.uk.

My contact address is: Jenny Jepson, Faculty of Health Sciences, University of Southampton, Highfield, Southampton, SO17 1BJ

Consent to Participate

By clicking on the 'Survey Link' below you acknowledge that you have read and understand that:

- Your participation in this survey is voluntary. You may withdraw your consent and discontinue participation in the study at any time. Your refusal to participate will not result in any penalty. Please note: if you withdraw your consent after starting the survey, you may still receive a reminder email to complete each section (1 week after commencement), please disregard this anomaly and be reassured that you will not receive any further correspondence.

- You have given consent to be a subject of this research.
- You have read (in full) this information sheet.

If you wish to continue please complete the survey which is available via the link below

Clicking on the 'Click here to take this survey ' button will take you directly to the survey; it should take you approximately 15 minutes to complete. The final question of the survey will direct you to the post-survey questionnaire which should take you approximately 15 – 20 minutes to complete.

This link is unique to you and your email address. Please do not forward it.

Thank you very much for considering taking part in this pilot study.

Appendix G: Ethical approval

Faculty of Science

University of Portsmouth

St Michael's Building

White Swan Road

PORTSMOUTH

PO1 2DT

Ms J Jepson

19th December 2012

FAVOURABLE OPINION

Protocol Title:	The transition to becoming an on-line course developer: barriers and enablers
Date Reviewed:	24/10/12 – 18/12/12
Ethics Number:	SFEC 2012 - 010

Dear Ms Jepson,

Thank you for resubmitting your protocol for ethical review and for the clarifications provided. Your responses have been reviewed and I am pleased to inform you that your application has been given a favourable opinion by the Science Faculty Ethics Committee. Please notify us in the future of any substantial amendments that may be required and send us a final study report.

Good luck with the study.

Dr Jason Oakley
SHSSW member, Science Faculty Ethics Committee

CC -
Dr Chris Markham – Chair of SFEC
Dr Jim House – Vice Chair of SFEC
Dr John Crossland
Holly Shawyer – Faculty Administrator

Appendix H: Online Consent

Technology Enhanced Learning (TEL): Experiences and Perceptions

Thank you for agreeing to contribute to my research. The survey contains 1 section relating to your place of employment and your job role; plus 6 sections of short open and closed questions, each of which consider your experiences and perceptions of Technology Enhanced Learning [TEL]. The questions ask about the factors that may influence your engagement with TEL and include sections on demography, your preferred teaching method, your perception of VLEs, the culture of your organisation as it relates to TEL, and finally what motivates you at work - included in this final section is the opportunity for you to review your individual **learning** style. You will then be given the opportunity to discuss and explore your answers by talking directly to the researcher, Jenny Jepson, via Skype, telephone or email. In total it should take you approximately 18 minutes to complete. If you start the survey and wish to return to it later (which includes exiting from the survey site), click the 'SAVE AND QUIT' button, this will then allow you to return to the point at which you left by opting to return using the unique web link generated for you with personal username and password OR by email (this email link will not compromise your anonymity). Remember to store the username and password prior to closing the survey.

On completion of the study you will be automatically directed to a closed survey site (that I do not have access to) where you have the option of submitting you name and email address. As a thank you for completing the survey, your name will be included in a lottery draw giving you a chance to win one of two £50 vouchers.

☐ Please tick (check) this box to indicate that you consent to taking part in this survey

Click here to start this survey

Appendix I: Introductory email sent to Dean/Head of Faculty (example)

Dear Professor xxxxx

My name is Jenny Jepson, I am a member of the teaching staff within the Faculty of Health Sciences, at the University of Southampton, I am also a student currently studying towards a Professional Doctorate in Health Sciences at the University of Portsmouth.

I am writing to explain the research study that I am intending to complete over the next year and my reason for contacting you directly. For my research I am exploring the relationships between lecturers' engagement in technology enhanced learning and demography, their preferred face to face teaching methods and perceptions of technology, as well as organisational culture, work values and their learning styles.

As part of this research I am intending to recruit a sample of lecturers, from all universities in the United Kingdom, to take part in an online survey which commenced in **March 2014**. I would value the opportunity to include staff members from your establishment and would be willing to meet with you and/or your staff prior to this date to discuss the study in greater detail if you feel this would be beneficial.

To comply with data protection I am requesting your support with the recruitment process and am writing to obtain consent to contact your staff either directly or indirectly. I have conducted an extensive pilot study at one university in London where the head of programmes distributed the attached letter of invitation by email to staff to contact me if they wished to take part in the research. This worked particularly well as the head of programmes also endorsed the research by personally emphasising the contribution staff could make in relation to their own future engagement with technology enhanced learning and teaching, and the support processes that may be identified in relation to staff development. All staff taking part in the research will be anonymised.

If you feel I have misdirected this mail, I would be grateful if you could forward it on to a more appropriate member of your staff.

I have attached for your perusal and distribution

- an invitation advising the staff member that they are invited to participate in the survey.

If requested I can forward to you an information sheet explaining in greater detail the purpose and aims of the study; presently this document contains a unique link to the survey tool hence the reason for not including it within this initial correspondence.

Please could I ask that if any of your staff have any questions regarding the study, or if you require any further information that you contact me directly. If requested, I am happy to share my findings with your organisation.

Yours sincerely

Jenny Jepson (Ms) (with email signature)

Appendix J: Email to academics; sent out by the agreeing institution

Ethics Number: SFEC 2012 – 010

Dear colleague

My name is Jenny Jepson I am a member of the teaching staff within the Faculty of Health Sciences, at the University of Southampton, I am also a student currently studying towards a Professional Doctorate in Health Sciences at the University of Portsmouth. xxxxxxx, Head of Department of Health Professions has kindly agreed to send out this request on my behalf.

I would like to invite you to take part in my research study which aims to explore lecturers' experiences and perceptions of the transition from traditional taught courses to an online (internet) environment utilising Technology Enhanced Learning (TEL).

Before I can proceed with the study I will need you to initially express your interest in taking part by a return email. The information relating to your contact details will be kept in a secure place and separate from the information collected during the survey. On your completion of the study I will not be able to attribute your responses to you; the electronic survey tool completely randomises individual anonymity. All information you share with me will be confidential and will only be seen by myself and my supervisors, at all times your identity as a participant in the study will not be known by me. There will be no individual identifiable material in the survey. Online returns will be stored anonymously with randomly allocated anonymity of your name or anything that would identify you to me or to others. All documentation; including your initial e-mail correspondence, will be stored in a computer file that is password protected. As a thank you for completing the online survey I am offering you the chance to take part in a lottery draw which will randomly select two participants; each will receive a £50 Amazon voucher. The lottery is held on a separate university server to the research survey; it is accessible via the research survey but has no correlation to the research participant.

On receipt of your expression of interest to take part in the study I will send to you

- An information sheet which fully describes the study, with online consent to participate, which also gives direct access to the survey tool.

Thank you for taking time to read this correspondence, I look forward to hearing from you.

Kind regards

Jenny Jepson
Professional Doctorate in Health Sciences Student, University of Portsmouth
Tel: 023 80 59 8264

Email: J.Jepson@soton.ac.uk
Skype: jennyjepson1

Appendix K: Information sheet (Main Study)

Study Name: Lecturers' Experiences and Perceptions of the transition from traditional taught courses to an online (internet) environment utilising Technology Enhanced Learning (TEL).

Name of researcher: Jenny Jepson

Supervisors: Dr Ann Dewey & Dr Penny Delf

I would like to invite you to take part in a research study that explores lecturers' experiences and perceptions of the transition from traditional taught courses to an online (internet) environment utilising Technology Enhanced Learning (TEL).

I have chosen your university as you deliver programmes/educational modules to nursing and non-medical health professionals. Before you decide, it is important for you to understand why the research is being done and what it would involve for you. Please consider the following information carefully and take time to decide whether or not you would like to take part. This information sheet will describe the study. At the end of the sheet you will be given the opportunity to consent to participate, your agreement will take you directly to the survey questions. Completion of the survey should take approximately 18 minutes.

Thank you for taking time to read this

What is the purpose of the study?

The purpose of this study is to explore lecturers' experiences and perceptions of the transition from traditional taught courses to an online (internet) environment utilising Technology Enhanced Learning (TEL).

This information will be used to:-

- Investigate the potential reasons why some lecturers engage whilst others do not with the processes employed to support the development of online learning.
- Ascertain whether relationships exist between the lecturers' engagement with TEL, and computer skills and exposure: including the use of Web 2.0 technologies, work values and their individual learning style.
- Explore the relationship between the cultural environment of the educational establishment and its influence on the lecturer's engagement with TEL.
- Contribute to a Professional Doctorate in Health Sciences for which I am studying.

In addition information and data from the study may be used to:

Identify strategies to support focused TEL staff development and promotion.

How will the study be undertaken?

An online survey: Delivered to identified lecturers within either a Nursing and/or Health sciences faculty within all UK universities, all of the Higher Education institutions deliver learning modules to nursing and non-medical health professionals.

Who has been invited to take part?

Teaching staff who either deliver or who have developed online learning and teaching materials/modules.

Who is undertaking the study?

The study is being undertaken by me; Jenny Jepson, a member of the Faculty of Health Sciences Technology Enhanced Learning Team and a Lecturer in the Faculty of Health Sciences at the University of Southampton. I am undertaking this study as part of my Professional Doctorate in Health Sciences research at the University of Portsmouth and **not** as part of my Lecturer or TEL role.

Do I have to take part?

No. It is up to you to decide if you want to take part or not; please click on the '**Opt out of this survey**' hyperlink at the end of this information if you do not wish to participate.

What will happen if I decide to take part?

You will be asked to click on the **'Click here to take part in this survey'** hyperlink at the end of this information; read the questions carefully at the bottom of this sheet as by clicking on the hyperlink you are giving your consent to participate. You will be reminded of your consent to participate on first accessing the survey questionnaire. You can return to the questionnaire through this link at any point.

Why is there no paper consent form?

A consent form is written confirmation that you agree to take part in the study, when you **'click here to take part in this survey'** you will be reminded that you have consented to participate, and will be given access to the survey questionnaire. Your return of the completed online survey will affirm your agreement to take part.

What will happen if I decide not to take part?

Please click the **'Opt out of this survey'** button at the end of this information. If you decide you don't want to take part in the study that is OK, you won't have to give a reason, and you will not be contacted again.

What are the benefits of taking part?

Knowing that the views and experiences you have contributed to this study will add to a body of knowledge about TEL.

Who had reviewed the study?

The study proposal and accompanying information has been seen and approved by the School of Health Sciences and Social Work Ethics Committee at the University of Portsmouth.

What if I have a concern or complaint?

If you have a concern or a complaint about this study you should contact Dr Jason Oakley, Science Faculty Ethics Committee member at jason.oakley@port.ac.uk

Will my involvement in this study be kept strictly confidential?

Yes. The procedures for handling, processing, storage and destruction of the data comply with the 1998 Data Protection Act. This means that all information about your contact details will be kept in a secure place and separate from the information collected during the survey.

You may or may not know others taking part in the study. I would respectfully ask that any information included on the survey is not discussed or shared with anyone so that your own confidentiality is maintained.

All information you share with me will be confidential and will only be seen by myself and my supervisors, at all times your identity as a participant in the study will be protected by me. There will be no individual identifiable material in the survey, unless you decide to provide your details for further contact. Online returns will be stored anonymously using coded details of your university, and name or anything that would identify you to me or to others. All documentation will be stored in a computer file that is password protected.

After the study has finished any information relating to the study will be stored securely for 10 years and then destroyed as confidential waste in line with University of Southampton information storage policy.

What will happen to the findings of the study?

The findings of the study will form part of my thesis and may be published in academic journals relating to nurse/health professional education and technology enhanced learning as it relates to health care professionals. No participants will be identified in any publications and seminars. Your employer has been given the opportunity to request the findings from this study, please be reassured that they will not know who has, or who hasn't taken part. All information fed back will relate to group activity rather than individual activity. In the unlikely event that your response is the only response received from your institution then this data set will **not** be included in any feedback or subsequent publication.

What do I do if I am interested in taking part or would like further information?

If you think you would like to take part in this study but would first like to talk to me, my contact number is: 023 80 59 8264, my Skype details are jennyjepson1 and my email address is: J.Jepson@soton.ac.uk.

Contact details of researcher: Jenny Jepson, Faculty of Health Sciences, University of Southampton, Highfield, Southampton, SO17 1BJ

Tel: 023 80 59 8264;

Skype : jennyjepson1;

email: J.Jepson@soton.ac.uk

By clicking on the hyperlink "Click here to take part in this survey" below you acknowledge that you have read and understand that:

- Your participation in this survey is voluntary. You may withdraw your consent and discontinue participation in the project at any time. Your refusal to participate will not result in any penalty. **Please note: if you withdraw your consent after starting the survey, you will still receive a reminder email to complete each section (4 weeks after commencement), please disregard this anomaly and be reassured that you will not receive any further correspondence.**
- You have given consent to be a subject of this research.
- You have read (in full) this information sheet.

If you wish to continue please complete the survey which is available via the link below
THESE LINKS ARE NOT ELECTRONICALLY LINKED TO THE DATA COLLECTION INSTRUMENT

Click here to take this survey

To opt out of this survey click here

Clicking on the **'Click here to take this survey '** button will take you directly to the survey; it should take you approximately 18 minutes to complete. The final question of the survey asks if you would like to be entered into a lottery draw. At this point you will be directed to a separate university server where the random selection of two winners, to receive the prize of a £50 Amazon voucher each, will be generated, I will not know who you are but do greatly appreciate your participation.

This link is unique to you. Please do not forward it.

Thank you very much for considering taking part in this study

Appendix L: Main study data collection tool

TECHNOLOGY ENHANCED LEARNING (TEL):

Experiences and Perceptions

Thank you for agreeing to contribute to my research. The survey contains one section relating to your place of employment and your job role; plus six sections of short open and closed questions, each of which considers your experiences and perceptions of Technology Enhanced Learning (TEL). The questions ask about the factors that may influence your engagement with TEL and include sections on demography, your preferred teaching method, your perception of VLEs, the culture of your organisation as it relates to TEL, and finally what motivates you at work – included in this final section is the opportunity for you to review your individual **learning** style. You will then be given the opportunity to discuss and explore your answers by talking directly to the researcher, Jenny Jepson, via Skype, telephone or email. In total it should take you approximately 18 minutes to complete. If you start the survey and wish to return to it later (which includes exiting from the survey site), please click the 'SAVE AND QUIT' button, this will then allow you to return to the point at which you left by opting to return using eh unique web link generated for you with personal username and password OR by email (this email link will not compromise your anonymity).

Remember to store the username and password prior to closing the survey.

On completion of the questionnaire you will automatically directed to a closed survey site (that I do not have access to) where you have the option of submitting your name and email address. As a thank you for completing the survey, your name will be included in a lottery draw giving you a chance to win one of two £50 vouchers.

Section 1: Introduction

Question 1.1. Where are you currently employed?

Question 1.2.

What is your current professional role?

☐ Audiologist

☐ Counsellor

☐ Dental Nurse

☐ Dietician

☐ Forensic Scientist

☐ Health Scientist

☐ Health Visitor

☐ Midwife

☐ Nurse

☐ Occupational Therapist

☐ Optometrist

☐ Paramedic

☐ Pharmacist

☐ Physiotherapist

☐ Podiatrist

☐ Radiographer

☐ Social Worker

☐ Speech and Language Therapist

☐ Therapeutic Art

☐ Other

Question 1.2b

Please provide detail here.

Section 2: Engagement with Technology Enhanced Learning.

Technology Enhanced Learning refers to the enhancement of existing and new learning experiences through the utilisation of one or more technologies.

*Please choose only **one** to answer in this section.*

2.1 In considering your role with Technology Enhanced Learning you would say that you are…

Fully engaged with no support ☐

Fully engaged with minimal support ☐

Engaged but requiring extensive support ☐

Engaged but not actively contributing ☐

Part of a module (development) team but not engaged in any way ☐

Save and Quit

Section 3: Demography and Background information.

*Choose only **one** answer in Question 3.1. Answer **each** section in Questions 3.2 and 3.3.*

3.1 Years of service:

How many years of experience do you have in higher education learning and teaching?

☐ ~2 years ☐ 2- 5 years ☐ 6 – 9 years ☐ 10 – 14 years ☐ > 15 years

3.2 Computer skill.

Would you say that working with computers …

a) is very difficult

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

b) is very complicated

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

c) requires technical ability

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

d) creates psychological stress

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

e) can only be done if one has been trained

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

f) is only advisable for people with a lot of patience

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

g) makes a person more productive at his/her job

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

h) is for young people only

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and Quit

3.3 Computer exposure:

Which web technologies do you use to support your online teaching …

a) Blog

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

c) Wiki

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

d) Podcast

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

e) Lecture capture

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

f) Adobe Connect

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

g) Photographs

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

h) RSS (Really Simple Syndication) feeds

Never< ---------- Always >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

i) Twitter

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

j) Videos

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

k) Skype

Never< ---------- Always >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and Quit

Section 4: Preferred Face to Face Teaching Method

*Please **rank** your preferences – 1 indicates your strongest preference whilst 5 is your least preferred approach.*

4.1 Teaching in Higher Education: I want to know which of the following is your preferred approach to teaching …

My preferred approach to teaching is

-	✓	LECTURE -Teaching as imparting information (teacher centred/student passive recipient
-	✓	PROBLEM SOLVING -Teaching as transmitting structured knowledge (teacher centred/student recipient
-	✓	GROUP DISCUSSION -Teaching as an interaction between the teacher and the student (teaching interactive/student participation
-	✓	PROBLEM BASED LEARNING -Teaching as facilitating understanding on the part of the student (student centred/teacher facilitates/student constructs knowledge within teacher's framework
-	✓	ENQUIRY BASED LEARNING -Teaching as bringing about conceptual change and intellectual development in the student (student centred/teacher acts as a change agent/developer/student develops by constructing meaning)

Save and Quit

Section 5: Participants' perception of Virtual Learning Environments

Please answer each of the sections in Questions 5.1, 5.2, 5.3 and 5.5.

Choose only one answer in Question 5.4 and Question 5.6.

5.1 Anticipated consequences of use: I want to know if you would say that …

Working with a computer would make me very nervous

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

I get a sinking feeling when I think of trying to use a computer

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Computers make me feel uncomfortable

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Computers make me feel uneasy and confused

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5.1 Utilisation: I want to know if you feel confident …

Starting an internet search engine i.e. Internet Explorer, Google, Mozilla Firefox

Not at all confident< ---------- Totally confident >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Connecting to the internet homepage that I want i.e. Internet Explorer, Mozilla Firefox

Not at all confident< ---------- Totally confident >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Downloading and saving files e.g. pdf

Not at all confident< ---------- Totally confident >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Providing hyperlinks from the internet into emails

Not at all confident< ---------- Totally confident >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Finding previous pages by using the 'back' button

Not at all confident< ---------- Totally confident >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Using internet search engines such as Google, Yahoo

Not at all confident< ---------- Totally confident >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5.2 Impact: I want to know what factors impact on any (further) development of your (or any potential) engagement with online learning over the coming years?

Time required to learn how to use the technology

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Lack of confidence

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Lack of incentives

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Lack of enthusiasm for it

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Don't want to change

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Don't think it enhances student learning

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Lack of academic staff development

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Lack of support staff

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Current organizational structure

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Technical problems/unreliable network

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Too many different standards and guidelines

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Too few standards and guidelines

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

5.3 Attitudes towards using: I want to know which one of the following statements summarises your feelings about using VLEs

☐ I am sceptical of new web technologies and use them only when I have to

☐ I am usually one of the last people I know to use new web technologies

☐ I usually use new web technologies when most people I know do

☐ I like new web technologies and use them before most people I know

☐ I love new web technologies and am among the first to experiment and use them

5.5: Task-technology fit: I want to know in what way a Virtual Learning Environment, for example Web CT, Blackboard, Moodle, supports your module delivery …

The VLE fits well with the way I like to work

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

The VLE is compatible with all aspects of my work

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

The VLE is easy to use

Strongly disagree< ---------- Strongly agree >
☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

The VLE is user friendly

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

It is easy to get the VLE to do what I want it to do

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

It is easy for me to become more skilful at using the VLE

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

New features are easy to learn

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

The output is presented in a useful format for students to understand

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Materials can be easily updated

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Please identify the VLE that you regularly use (please tick all that apply)

☐ Web CT ☐ Blackboard ☐ Computer Management System i.e. Sharepoint, Site Publisher ☐ WordPress ☐ Moodle ☐ Other(s): please state in the box provided

Save and Quit

Section 6: Culture of the Higher Education Institution as it relates to TEL

Please answer every question in all of the sections.

6.1 Lecturer support: As a lecturer/researcher in health care sciences would you say that you feel …

That colleagues in your faculty/department care about each other

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That you are encouraged to ask questions

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Connected to others who are developing online courses

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That it is hard to get help when you have a question

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Lacking in a spirit of belonging

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Uneasy about exposing gaps in your understanding

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Isolated whilst developing online materials/modules/ courses

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Reluctant to speak openly

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That you can rely on other members of staff to help with the development/delivery of your online module(s) of learning

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That other colleagues do not help you to learn

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That other members of teaching staff who teach on your module depend on you

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That you are given ample opportunities to learn

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

That your educational needs are not being met

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Confident that others will support you

Strongly disagree< ---------- Strongly agree >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and Quit

Section 7: Work Motivation and Learning Styles

*Please answer **each** section within Question 7.1.*

*Please answer **all** of the Individual Learning Styles questions. Remember to give the first answer that enters your head when answering this validated questionnaire.*

7.1 Work Motivation and Values: In relation to your current work role I want to know the importance you place on these factors …

Job security

Not important< ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Opportunity for personal growth

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

A fair and considerate boss (line manager)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

The opportunity for you to use your ability (knowledge base)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Convenient (flexible to suit you) hours of work

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Recognition for doing a good job

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Job status

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Responsibility (empowerment)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Opportunity to interact with people

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Achievement at work

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Benefits (good holiday leave; sick leave; study leave etc.)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Influence in the work place

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Co-workers (pleasant fellow workers)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Interesting work

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Satisfactory pay (the amount of money you get)

Not important < ---------- Extremely important

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Advancement (chances for promotion)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Work conditions (comfortable and clean)

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Meaningful, important work

Not important < ---------- Extremely important >

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

Save and Quit

7.2 Learning Styles inventory

The following questions are adapted from the INDEX OF LEARNING STYLES INVENTORY - Reproduced with kind permission from Richard M. Felder and Barbara A. Soloman, *Index of Learning Styles*, http://www.ncsu.edu/felder-public/ILSpage.html, accessed 11 November 2012.

I want to know what your LEARNING style is (not yoru teaching style). Please choose only one answer for each question. If both responses seem to apply, think about the last time you were in a learning situation before responding. You are invited to contact the researcher (see Section 8) for your Index of Learning Styles score, and feedback relating to your identified learning style.

45. I understand something better after I

- **(a)** try it out.
- **(b)** think it through.

46. I would rather be considered
    - **(a)** realistic.
    - **(b)** innovative.
47. When I think about what I did yesterday, I am most likely to get
    - **(a)** a picture.
    - **(b)** words.
48. I tend to
    - **(a)** understand details of a subject but may be fuzzy about its overall structure.
    - **(b)** understand the overall structure but may be fuzzy about details.
49. When I am learning something new, it helps me to
    - **(a)** talk about it.
    - **(b)** think about it.
50. As a teacher, I would rather teach a course
    - **(a)** that deals with facts and real life situations.
    - **(b)** that deals with ideas and theories.
51. I prefer to get new information in
    - **(a)** pictures, diagrams, graphs, or maps.
    - **(b)** written directions or verbal information.
52. Once I understand
    - **(a)** all the parts, I understand the whole thing.
    - **(b)** the whole thing, I see how the parts fit.
53. In a study group working on difficult material, I am more likely to
    - **(a)** jump in and contribute ideas.
    - **(b)** sit back and listen.
54. I find it easier
    - **(a)** to learn facts.
    - **(b)** to learn concepts.
55. In a book with lots of pictures and charts, I am likely to
    - **(a)** look over the pictures and charts carefully.
    - **(b)** focus on the written text.
56. When I solve maths problems
    - **(a)** I usually work my way to the solutions one step at a time.
    - **(b)** I often just see the solutions but then have to struggle to figure out the steps to get to them.
57. In classes I have taken
    - **(a)** I have usually got to know many of the students.
    - **(b)** I have rarely got to know many of the students.

58. In reading non-fiction, I prefer
    - **(a)** something that teaches me new facts or tells me how to do something.
    - **(b)** something that gives me new ideas to think about.
59. I like teachers
    - **(a)** who put a lot of diagrams on the board.
    - **(b)** who spend a lot of time explaining.
60. When I'm analysing a story or a novel
    - **(a)** I think of the incidents and try to put them together to figure out the themes.
    - **(b)** I just know what the themes are when I finish reading and then I have to go back and find the incidents that demonstrate them.
61. When I start a 'homework' problem, I am more likely to
    - **(a)** start working on the solution immediately.
    - **(b)** try to fully understand the problem first.
62. I prefer the idea of
    - **(a)** certainty.
    - **(b)** theory.
63. I remember best
    - **(a)** what I see.
    - **(b)** what I hear.
64. It is more important to me that an instructor
    - **(a)** lay out the material in clear sequential steps.
    - **(b)** give me an overall picture and relate the material to other subjects.
65. I prefer to study
    - **(a)** in a study group.
    - **(b)** alone.
66. I am more likely to be considered
    - **(a)** careful about the details of my work.
    - **(b)** creative about how to do my work.
67. When I get directions to a new place, I prefer
    - **(a)** a map.
    - **(b)** written instructions.
68. I learn
    - **(a)** at a fairly regular pace. If I study hard, I'll "get it."
    - **(b)** in fits and starts. I'll be totally confused and then suddenly it all "clicks."
69. I would rather first
    - **(a)** try things out.
    - **(b)** think about how I'm going to do it.

70. When I am reading for enjoyment, I like writers to
    - **(a)** clearly say what they mean.
    - **(b)** say things in creative, interesting ways.
71. When I see a diagram or sketch in class, I am most likely to remember
    - **(a)** the picture.
    - **(b)** what the instructor said about it.
72. When considering a body of information, I am more likely to
    - **(a)** focus on details and miss the big picture.
    - **(b)** try to understand the big picture before getting into the details.
73. I more easily remember
    - **(a)** something I have done.
    - **(b)** something I have thought a lot about.
74. When I have to perform a task, I prefer to
    - **(a)** master one way of doing it.
    - **(b)** come up with new ways of doing it.
75. When someone is showing me data, I prefer
    - **(a)** charts or graphs.
    - **(b)** text summarizing the results.
76. When writing a paper, I am more likely to
    - **(a)** work on (think about or write) the beginning of the paper and progress forward.
    - **(b)** work on (think about or write) different parts of the paper and then order them.
77. When I have to work on a group project, I first want to
    - **(a)** have "group brainstorming" where everyone contributes ideas.
    - **(b)** brainstorm individually and then come together as a group to compare ideas.
78. I consider it higher praise to call someone
    - **(a)** sensible.
    - **(b)** imaginative.
79. When I meet people at a party, I am more likely to remember
    - **(a)** what they looked like.
    - **(b)** what they said about themselves.
80. When I am learning a new subject, I prefer to
    - **(a)** stay focused on that subject, learning as much about it as I can.
    - **(b)** try to make connections between that subject and related subjects.
81. I am more likely to be considered
    - **(a)** outgoing.
    - **(b)** reserved.

82. I prefer courses that emphasize
    - **(a)** concrete material (facts, data).
    - **(b)** abstract material (concepts, theories).
83. For entertainment, I would rather
    - **(a)** watch television.
    - **(b)** read a book.
84. Some teachers start their lectures with an outline of what they will cover. Such outlines are
    - **(a)** somewhat helpful to me.
    - **(b)** very helpful to me.
85. The idea of doing homework in groups, with one grade for the entire group,
    - **(a)** appeals to me.
    - **(b)** does not appeal to me.
86. When I am doing long calculations,
    - **(a)** I tend to repeat all my steps and check my work carefully.
    - **(b)** I find checking my work tiresome and have to force myself to do it.
87. I tend to picture places I have been
    - **(a)** easily and fairly accurately.
    - **(b)** with difficulty and without much detail.
88. When solving problems in a group, I would be more likely to
    - **(a)** think of the steps in the solution process.
    - **(b)** think of possible consequences or applications of the solution in a wide range of areas.

Section 8: Further information

The final question will ask you for your contact details. You are under no obligation to provide these.

Question 8.1

If you wish to contact the researcher for further information relating to this study (including your Identified Learning Style result), or you are happy to be contacted via telephone or Skype for a brief follow up discussion, please enter your name and contact details in the box provided. Personal data provided will not be made available to anyone other than the researcher.

When you click the Save and Finish button you will be transferred to a separate site which I do not have access to. Here you will be given the opportunity to submit your name and email details for inclusion in the TEL lottery draw for one of two £50 prizes. Good luck and thank you for completing the survey.

Save and Finish

Appendix M: Research ethics review checklist

FORM UPR16

Research Ethics Review Checklist

Please include this completed form as an appendix to your thesis (see the Postgraduate Research Student Handbook for more information

Postgraduate Research Student (PGRS) Information			**Student ID:**	**381905**
Candidate Name:	**Jennifer Jepson**			
Department:	**School of Health Sciences and Social Work**	**First Supervisor:**	**Dr Ann Dewey**	
Start Date: (or progression date for Prof Doc students)	**3 January 2012**			

Study Mode and Route:	Part-time ✓	MPhil ❑	Integrated Doctorate (NewRoute) ❑
	Full-time ❑	MD ❑	
		PhD ❑	Prof Doc (PD) ✓

Title of Thesis:	Exploring associated factors and dynamic relationships between lecturers and their engagement with Technology Enhanced Learning (TEL).
Thesis Word Count: (excluding ancillary data)	47,153

If you are unsure about any of the following, please contact the local representative on your Faculty Ethics Committee for advice. Please note that it is your responsibility to follow the University's Ethics Policy and any relevant University, academic or professional guidelines in the conduct of your study

Although the Ethics Committee may have given your study a favourable opinion, the final responsibility for the ethical conduct of this work lies with the researcher(s).

UKRIO Finished Research Checklist: (If you would like to know more about the checklist, please see your Faculty or Departmental Ethics Committee rep or see the online version of the full checklist at: http://www.ukrio.org/what-we-do/code-of-practice-for-research/)	
a) Have all of your research and findings been reported accurately, honestly and within a reasonable time frame?	**YES**
b) Have all contributions to knowledge been acknowledged?	**YES**
c) Have you complied with all agreements relating to intellectual property, publication and authorship?	**YES**
d) Has your research data been retained in a secure and accessible form and will it remain so for the required duration?	**YES**
e) Does your research comply with all legal, ethical, and contractual requirements?	**YES**

*Delete as appropriate

Candidate Statement:	
I have considered the ethical dimensions of the above named research project, and have successfully obtained the necessary ethical approval(s)	
Ethical review number(s) from Faculty Ethics Committee (or from NRES/SCREC):	SFEC 2012 - 010
 **Signed:** ***(Student)***	**Date:13 May 2015**
If you have *not* submitted your work for ethical review, and/or you have answered 'No' to one or more of questions a) to e), please explain why this is so:	
Signed: ***(Student)***	**Date:**

HIGHER EDUCATION LECTURERS' EXPERIENCES AND PERCEPTIONS OF THE TRANSITION FROM TRADITIONAL FACE TO FACE TAUGHT COURSES TO AN ONLINE (INTERNET) ENVIRONMENT UTILISING TECHNOLOGY ENHANCED LEARNING (TEL).

JENNY JEPSON
FACULTY OF HEALTH SCIENCES, UNIVERSITY OF SOUTHAMPTON

Introduction

The Dearing Report (NCIHE, 1997), Melville Report (2009), and the Collaborate to Compete Report (HEFCE, 2011) all affirmed that changes in technology are rapid, whereas the development and adoption by lecturers of the appropriate pedagogy are not. The challenge for lecturers is to develop their own skills to utilise technology for learning enhancement in order to meet the future generation of students' expectations. The results of my Doctoral research may provide guidance for staff support and developmental programmes, and identify means to encourage lecturers' involvement with TEL.

Aim/purpose of my research

To identify enablers and barriers to lecturers' engagement with TEL using a pilot tested online questionnaire delivered to all Health Science providers within Higher Education Institutions in the UK

Key research question/Hypothesis

Does number of years teaching experience, current skills/use of technology, preferred delivery of teaching practice, previous use and engagement with technology influence lecturers engagement with TEL within the Health Sciences Sector of Higher Education?

	Research Objectives
1	To develop and deliver an online questionnaire at one university.
2	To measure face and content validity in order to adapt and inform the final version questionnaire for the main study. The pilot questionnaire contained sections relating to demography, lecturer perception of technologies/VLEs, preferred delivery method of face to face teaching, organisational culture, work motivation and learning style of the lecturer .
3	Conduct the main study administering an online questionnaire to
3.1	Investigate the potential reasons why some lecturers engage whilst others may not fully engage with the processes employed to support the development and facilitation of online learning.
3.2	Explore lecturers' perceptions of the impact of online learning on student learning.
3.3	Ascertain whether relationships exist between the lecturers' engagement with TEL, and computer skills and exposure: including the use of Web 2.0 technologies, motivation and individual learning style.
3.4	Explore the relationship between the cultural environment of the educational establishment and its influence on the lecturer's engagement with TEL.

Research methodology

- Cross-sectional survey using an online questionnaire.
- Recruitment: Contacted all 76 Health Science education providers in the UK.
- Data Collection: Survey research, from a sample of higher education lecturers within the UK.

Results and findings to date

• OBJECTIVES 1 & 2: Pilot study: in order to maximise data collection in the main study, a new data collection tool was devised and designed. As part of the development process to pilot the data collection tool the clarity of questions was established, along with the measurement of reliability and content validity.

- 5 questions were amended in light of responses received.
- Cronbach's alpha was calculated to assess the internal consistency: overall 0.84.

•OBJECTIVE 3: Main study: Data collection concluded end of September 2014.

• 49/76 FoHS agreed to take part.
  - 15/49 required additional ethical approval through their own university ethical procedures

• 3/76 refused to take part.

• 24/76 did not respond.
  - 7/24 received and approved additional ethical applications.

Planning ahead

Objective	Task description	Timeframe
Prepare results [SPSS version 20]	Upload csv files to SPSS: Run independent Learning Styles analysis: Conduct data analysis	October 2014
Write up results chapter (Ch. 5)		October/ November 2014
Review final chapters,		November 2014
Submit whole draft thesis to supervisors		November 2014
Submit thesis		December 2014
Prepare for Viva Voce	a) oral presentation b) mock Viva	January 2015

Dissemination

Presented at the EDULEARN 14 International Conference on Education and New Learning Technologies (Barcelona) 'Establishing the validity and reliability of a new data collection tool [pilot study]' July 2014.

Conclusions to date

The pilot study identified anomalies within the questionnaire which were addressed prior to commencing the main study.
Data collection within the main study proved to be protracted and time-consuming.
Access to potential respondents, and recruitment requires tenacity.
Careful record keeping is essential when large numbers are involved in data collection.

References

HEFCE. (2011). Collaborate to compete. Seizing the opportunities of online learning for UK higher education. Online Learning Task Force. Retrieved May 31, 2011, from http://www.hefce.ac.uk/pubs/hefce/2011/11_01/
Melville, D. (2009). *Higher education in a web 2.0 world: report of committee of enquiry into the changing learner experience*. Retrieved May 29, 2010, from http://www.clex.org.uk/CLEX_Report_v1-final.pdf.
NCIHE. (1997). *Higher education in the learning society*. Report of the National Committee of Inquiry into Higher Education: The Dearing Report. London: HMSO.