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Applying the Technology Acceptance Model to ascertain the acceptance of learning technologies in international students and academics – a case study at Coventry University London

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Contents

Abstract

Technology is transforming the way we live and work and has become a pervasive factor in UK Higher Education with universities incorporating learning technologies into their curricula and assessment strategies. As a result, academics have been encouraged to embed technology into their teaching practices in order to improve student engagement, student performance and to enable students to become digitally literate so that they can cope in a digitally-mediated society and technology-enabled future work environment.

For a number of years learning technologies have been championed as valuable tools in which to enhance learning in UK Higher Education, although current educational research has yet to demonstrate their effectiveness in achieving student learning gains. Several reasons have been contended for this situation, including the lack of time afforded to academics, incongruence with pedagogical approaches and the Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) of the technologies that are available. These issues have influenced technology acceptance in both students and academics. The Technology Acceptance Model (TAM) is one of several theories that have been used to ascertain technology acceptance and has been designed to understand how and why users accept and use a particular technology.

Coventry University London (CUL) is a prime example of a UK Higher Education institution that has invested a great deal of time and money into the implementation of learning technologies and it was unclear if this investment had been successful in meeting expectations and supporting student learning outcomes. In this study, TAM was applied using a Constructivist Grounded Theory (CGT) methodology with fellow academics and international students in order to uncover the reasons why they accept and use a particular technology. International students were selected due to being the most dominant population at CUL. The CGT approach was particularly beneficial in generating rich and meaningful findings by co-constructing data with international students and academics via my unique institutional insider perspective. A selection of specific qualitative methods were applied to make the process as robust as possible. These included interviews with students and academics and focus groups with students after each set of interviews to explore relevant issues in greater depth. Lesson observations took place to clarify if academics used technology to the extent they stated in the interviews and to observe its effects on international student engagement at first-hand. A focus group was also conducted with learning technologists and in-depth interviews with senior management to develop a wider perspective on academic and student acceptance of specific technologies.

As a result of this research, the Student and Academic Technology Acceptance Model (SATAM) was developed as a conceptual framework which identifies specific external variables that affect technology acceptance in academics and international students which ultimately lead to positive behavioural intention and actual system use.

The empirical data confirmed the view that specific learning technologies play a significant role in engaging an array of students in their studies.

New discoveries from the thesis indicate that academics are more influenced by the PEOU of learning technologies whereas students are more interested by their PU. Students were much more likely to accept a particular technology if it had a positive perceived effect on their academic performance and future employability.

These findings demonstrate the need for the institution to reconfigure and enhance the clarity of its technology-enhanced learning strategy. It was also discovered that the level of support offered to academics needed to be improved so that they are able to develop their IT competencies and ultimately enable international students to achieve learning outcomes.

Key words: TAM, International students, Academics, Learning technologies, Constructivist Grounded Theory, Qualitative methods, SATAM.

List of figures

List of tables

Glossary of terms

ACCA - Association of Chartered Certified Accountants

ARS – Audience Response Systems

BETT – British Educational Training and Technology show

CGT – Constructivist Grounded Theory

CIM – Chartered Institute of Marketing

CIPD – Chartered Institute of Personnel and Development

CMI – Chartered Management Institute

CPD – Continuous Professional Development

CUL – Coventry University London

GDPR – General Data Protection Regulation

GT – Grounded Theory

HE – Higher Education

HEA – Higher Education Academy

HEFCE – Higher Education Funding Council for England

HEI - Higher Education Institution

ICT – Information and Communications Technology

IDT – Innovation Diffusion Theory

ILM – Institute of Leadership and Management

IT – Information Technology

JISC – Joint Information Systems Committee

Knowledgecast – CUL terminology for lecture

LMS – Learning Management System

MOOCs – Massive Online Open Courses

ODF – Online Discussion Forum

OIL – Online International Learning

PEOU – Perceived Ease of Use

PU – Perceived Usefulness

QAA – Quality Assurance Agency

SATAM – Student and Academic Technology Acceptance Model

SCT – Social Cognitive Theory

SDT – Self Determination Theory

SPSS - Statistical Package for the Social Sciences

TAM – Technology Acceptance Model

TEF – Teaching Excellence Framework

TEL – Technology Enhanced Learning

THE – Times Higher Education

TLA – Teaching, Learning and Assessment

TPACK – Technology, Pedagogy and Content Knowledge

TPB – Theory of Planned Behaviour

TRA – Theory of Reasoned Action

3-TUM – Three Tier Use Model

UCISA - Universities and Colleges Information Systems Association

UK – United Kingdom

UTAUT – Unified Theory of Acceptance and Use of Technology

VLE – Virtual Learning Environment

Web 2.0 – The second stage of internet development with greater focus on content generated by users, interaction and social media growth.

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Publications from this thesis

Taylor, A. (2015) ‘Flipping great or flipping useless? A review of the flipped classroom experiment at Coventry University London Campus’. *Journal of Pedagogic Development* 5(3)

Taylor, A. (2017) ‘Discovering OIL: The Role of Online International Learning and International Field Trips in Enhancing Student Engagement and Performance’. *Journal of Pedagogic Development* 7(1)

Taylor, A. (2018) ‘The impact of employability on technology acceptance in students – findings from Coventry University London’. *Journal of Pedagogic Development* 8(3)

Chapter One – The Importance of Learning Technologies in Higher Education

1.0 Introduction to Chapter One

Chapter One is organised into seven sections and begins by discussing the evolution and importance of learning technologies[1] in Higher Education (HE), with particular emphasis provided on their influence on elevating student expectations and outcomes. After that, Coventry University London (CUL) is profiled in order to bring greater context to the research. The research aim, strategies, questions and research process are then explained and justified followed by a section on the unique contribution to knowledge that has emerged from the thesis. The chapter concludes with a summary of the first chapter and finally with an outline of the overall thesis.

1.1 The importance of UK Higher Education and the development of learning technologies

Higher Education (HE) plays a pivotal role in our rapidly globalised society (Kuroda 2016). Graduates generally improve their standard of living and communities can benefit from more educated citizens (Teague 2015). HE drives economic and societal advancement by creating 'high-quality graduates through high-quality teaching' (Bennett et al. 2018: 1014). However, HE institutions (HEIs) in the UK and beyond are encountering unprecedented change through globalisation, increasing numbers of students, economic uncertainty and the need to remain competitive in their offerings. The growing influence of technology is now pervasive in our personal and work lives and has caused universities to re-think their pedagogical strategies to meet the expectations of the students they teach and the academics they employ (JISC 2015a). HE possesses the capacity to enable individuals to cope with this

[1] Also referred to 'Edtech' by several scholars (such as by Englund et al. 2016). This thesis will use the term 'Learning technologies' due to this definition being most widespread in the literature examined in this thesis.

changing world and to deal with complex problems (Ramaley 2014) with technology playing a vital role in enhancing academic and student performance (Price and Kirkwood 2014; Walker et al. 2017). Understanding how to maximise the influence of learning technologies in HE has never been more important.

For many years, learning technologies have been promoted as valuable tools through which to enhance learning in UK HE although current educational research has yet to demonstrate their effectiveness in achieving student learning gains[2] (Price and Kirkwood 2014). Several reasons have been contended for this situation, including the lack of time afforded to academics, inconsistency with pedagogical approaches and the PU and PEOU of the technologies that are available (Laurillard 2002; Laurillard 2013). These issues have influenced technology acceptance in academics with UCISA (2018: 1) worryingly discovering that there is a lack of academic knowledge in developing Technology Enhanced Learning (TEL).

At CUL, the usage of interactive learning technologies is one of several key pedagogical strategies that are used to enhance student engagement inside and outside the classroom. A popular approach has been the utilisation of Virtual Learning Environments (VLEs) and interactive technological tools to engage students in the lesson content (JISC 2016). CUL is not alone in this strategy with many other universities in the UK also embedding these practices and other approaches such as MOOCs[3] into their teaching, learning and assessment (TLA) policies (JISC 2013b).

Indeed, the usage of learning technologies is becoming one of the most popular techniques used by universities and academics to engage their learners (Brown-McCabe and Meuter 2011; Hechter et al. 2012; Laurillard 2013). This approach has witnessed considerable pedagogical debate on how technology can be effectively utilised in order to better engage higher education students (Brown-McCabe and Meuter 2011) with the potential of technology still yet to be realised (Kirkwood and

[2] Growth or change in knowledge, skills, and abilities over time that can be linked to the desired learning outcomes or learning goals of the course as well as personal development (HEA 2017).
[3] Massive Open Online Courses.

Price 2013; Christensen and Eyring 2011; Englund et al. 2016) and needing to be understood in greater depth (Sharpe et al. 2006).
As Mishra et al. (2010: 2) comment:

> *'It is no surprise that the ongoing discussion of technology and its role in education takes on even greater significance today. This rapid rate of change can be a big challenge for educators, as technologies become obsolete as quickly as they arrive. With increased pressure on teachers to learn new ways to integrate technology with their teaching, billions of dollars and countless hours have been spent on hardware, preparation and training. Despite this, technology integration still finds disappointing levels of penetration and success'.*

The final sentence of this quotation is one of my main motivations for conducting this research. Promoting student participation and engagement through active learning with technology as a conduit in this process is a key aspect of CUL's TLA strategy, although its impact has been both inconsistent and for the most part disappointing. CUL's strategy appears to be more about sustaining existing pedagogical practices rather than using disruptive forms of innovation; correlating to the arguments of Flavin and Quintero (2018) and UCISA (2018). I have personally found this issue to be frustrating, as I support the view that technology can possess a number of advantages in elevating pedagogical practice and in improving the student learning experience. As Trowler (2010) claims, the usage of technology is able to act as a key lever between the teacher and student in improving student interaction in classroom activities.
There have been a number of studies that have highlighted a connection between teachers' beliefs about facilitating interaction through technology and Constructivism (Judson 2006). Although several studies have relied on data reported by teachers themselves, clear connections have been made between the creation of student-centred classrooms and the implementation of technology (Judson 2006). On the other hand, lesson observations at CUL have uncovered that the technology embedded in classes is not particularly engaging nor innovative despite teachers purporting to be "tech-savvy" and

proponents of Constructivist and student-centred learning practices confirming the findings of Ertmer and Ottenbreit-Leftwich (2010).

Digital learning is clearly a vital aspect of modern teaching in UK HE (Beetham and Sharpe 2013). A prime example emanates from JISC (2017b) which conducted an online digital experience survey with 22,000 UK HE students and discovered the following key facts in Table 1 below:

Table 1: Key facts – the importance of digital learning in UK HE

80.4% of HE students have reliable Wi-Fi access in their university.
95.1% have access to online course materials.
91.2% have access to institution owned computers and printers.
88.4% use their own laptop to support learning.
65.5% agree they have access to digital training and support when they need it.
31% agree that they are given the chance to be involved in decisions about digital services.
80% know where to get help within their university if they are bullied or harassed online.
35% agree they know how their personal data is stored and used.

Source: JISC (2017b)

As can be seen above, digital learning and digital literacy are both integral aspects of modern-day UK HE. Indeed, there is a growing movement across UK HE, which is seeking to understand how to develop digital literacy in UK HEIs.

As the HEA (2017) explains, digital literacies are the capabilities required to be successful in a digital society. This term was originally defined by Gilster (1997: 2) who articulates digital literacy as ‘the ability to both understand and use digitised information’. As Belshaw (2012) discusses, this definition was formed and developed as a result of other related concepts such as visual literacy (the usage of imagery to understand knowledge), technological literacy (the capability to use a particular technology), computer literacy (the use of computers to achieve a specific outcome) and information literacy (searching, using, evaluating and sharing information). “Digital literacy” for the purpose of

this thesis is defined as a set of academic and professionally situated practices that are supported by evolving and varied learning technologies (Sharpe and Beetham 2010; Gourlay and Oliver 2018). What it means to be “digitally” literate arguably changes over time and across contexts (JISC 2014).
There have been several case studies in UK HE that have sought to understand how technology can be better used to develop digital literacy. For instance, The University of Greenwich created the ‘Digital Critical Literacy Model’, The University of Plymouth initiated a project where digital literacy became part of the university’s overarching strategy and performance review process and The University of Reading organised a ‘digital ready project’ that focused on improving student employability through learning technologies (JISC 2013a). Moreover, The University of the Arts London created ‘The DIAL Project’, which sought to understand how learning technologies could improve employability, and The University of Greenwich involved staff and students in improving employability through the use of digital technologies in the curriculum (JISC 2013a). In addition, Oxford Brookes University’s project on “Graduate Attributes” emphasised the importance of developing digital and information literacy in students (Oxford Brookes University 2018). Unfortunately, studies such as these are quite rare. This thesis seeks to add to this body of literature.

Although technology is viewed as an important and effective strategy to be used in UK HE as discussed above, many teachers refrain from using it in the classroom (Balakrishnan and Gan 2013; Ardies et al. 2015). Nonetheless, Digital/ICT literacy can be regarded as one of the most essential qualities in foundational knowledge required in a 21st Century learner although there are a number of other qualities (such as Core Content Knowledge and Cross-disciplinary Knowledge) which also need to be met as can be seen in Figure 1 on page 24:

Figure 1: Essential qualities of 21st Century Learning

Source: Kereliuk et al. (2013)

Studies on developing digital literacy are growing in number, emphasising the importance of understanding how UK HEIs are able to enhance digital literacy in both students and academics. However, there is limited evidence on the relationship between technology and acceptance in UK HE. There is also a lack of studies that take technological acceptance into account from both academics and students. This thesis focuses on addressing this gap.

While technology in the form of smartphones, tablets and laptops may act as distractions for some students, this study seeks to deliver a balanced perspective on how these devices and accompanying software can present pedagogical opportunities to improve student engagement and motivation to engage more deeply with the lesson content.

Whereas university teachers in the past had to use their own repertoire of teaching techniques to engage their students, the popularity and effectiveness of learning technologies has arguably changed the traditional teacher-student paradigm (JISC 2017d). There is now a greater emphasis on the use of technology both inside and outside the classroom with this growth set to continue as both society and pedagogy become more technologically advanced

(Christensen and Eyring 2011), with learning technologies now a vital aspect in any academic's 'toolkit'[4].

There are a number of benefits for learners. For instance, Rashid and Asghar (2016) posit that HE students who effectively utilise learning technologies are much more likely to be collaborative and interactive with their peers and create a deeper and more sustained connection with their classmates. These perceived benefits for academics and students are relevant to all UK HEIs although especially so to CUL which particularly emphasises the use of learning technologies in its TLA strategy. This arguably adds greater gravitas and credibility to this research project.

Indeed, CUL places a great deal of importance in ensuring its students are exposed to technology-infused learning. The university's TLA focuses on this area in order:

> *'To ensure that teaching is designed to inspire and engage students in their chosen course through a range of techniques which encourage lively, interactive learning, and by drawing on relevant research and professional practice. Excellence in classroom teaching will be enriched by appropriate use of virtual environments, technology and specialist facilities'.* (Coventry University 2015: 1)

Furthermore, CUL's TLA strategy affirms that digital fluency is an essential outcome for students to develop due to it possessing the 'skills necessary for living, learning and working in a digital society' (Coventry University 2015: 1). As can be seen in the previous discussion, the importance of acquiring digital skills cannot be overemphasised.

Academic institutions such as CUL thus invest a great deal of time and resources into implementing technology into their learning and assessment

[4] The expression 'Toolkit' is used throughout the thesis. This refers to the resources, abilities and skills possessed and applied by academics in a teaching context.

policies correlating to the findings of Sharpe (2018). As mentioned above, a major reason for this investment is to further the student experience and to better engage learners in their subject so that they are able to successfully achieve their qualification and enhance their skill-sets. Although there have been notable improvements in student performance when implementing learning technologies in HE, its use is not always widespread. For instance, Cuban (2001: 134) in a study of technology in California education states:

> *'The overwhelming majority of teachers employed the technology to sustain existing patterns of teaching rather than to innovate … [and that] … only a tiny percentage of high school and university teachers used the new technologies to accelerate student-centred and project-based teaching practices'.*

This situation resonates at CUL with lesson observations indicating a reliance on more traditional "one-way" pedagogical practices. Academics rarely attend teaching workshops and only tend to apply new teaching techniques if they are shared informally in the staff room. As the use of technology is a major part of CUL's TLA strategy and something which students expect, this lack of engagement has not been helpful in meeting student expectations.

1.2 Student expectations

Student expectations and engagement is a vital concern for every UK HE academic institution. Indeed, Kandiko and Mawer (2013: 36) found that students saw their degree as a strategy to advance their careers with academics playing a key role in engaging students in their subject in order to accomplish this aim. The University of Winchester have recently started offering a PG Cert in Student Engagement, underlining the importance of enhancing the student experience for UK HEIs (University of Winchester 2018).

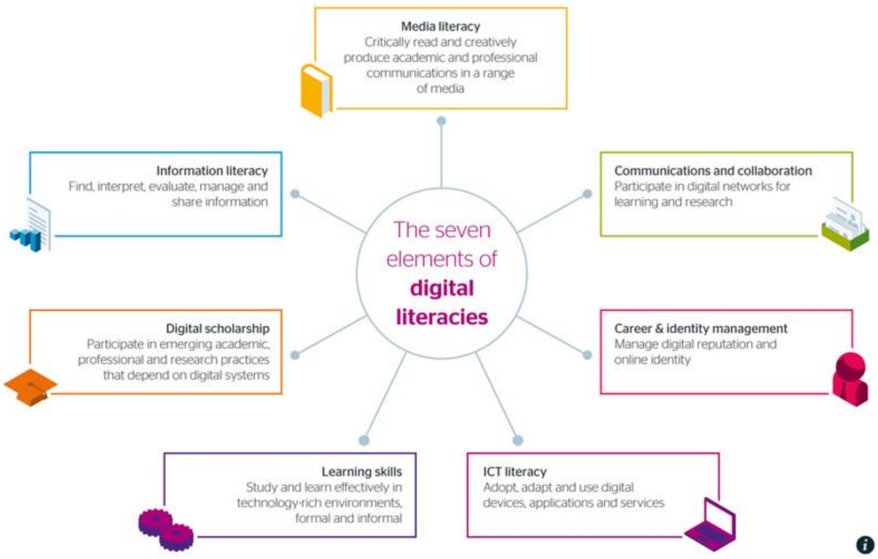
I will assert in this thesis that technology possesses the potential to play a vital role in the engagement of both academics and students, although there are specific external variables that are able to influence technology acceptance with student acceptance found to be particularly complex, due to the digital generation students generally originate from.

Indeed, there is a continuing debate regarding a new generation of students – referred to as ‘Digital Natives’, ‘Millennials’ and interestingly ‘Homo Zappians’ amongst others who are seen to possess advanced IT skills and a different set of cognitive capacities when compared to students of the past (Margaryan et al. 2011). Digital Natives (born on or after 1980) differ from ‘Digital Immigrants’ (those born before 1980) in that they think differently as their thought processes have been modified due to growing up and socialising in digitally-rich environments (Prensky 2001a; 2001b). Bennett et al. (2008) even affirm that there is a moral panic amongst educators (who tend to be Digital Immigrants) as they are unsure how to effectively engage Digital Natives in the classroom. Thus, it is important to change the way in which Digital Natives are educated. This in turn will necessitate refinements to curricula, the way lessons are taught as well as re-educating teachers so that they are able to effectively embed interactive learning technologies into their pedagogical practices (Prensky 2001a 2001b). The inclusion of learning environments which foster social networking, rewards, frequent feedback, random access to information as well as the ability to multi-task are all useful for modern-day learners.

Moreover, it has been discovered that Digital Natives are often frustrated and annoyed at the policies designed by Digital Immigrants that prohibit engagement with learning technologies (Prensky 2010). Digital Natives tend to get irritated by delays and possess the need to be part of a digital community on a constant basis (Tissington and Senior 2011). Indeed, in my experience the Digital Natives at CUL tend to view knowledge as a utilitarian concept in that it should be able to be accessed everywhere at any time, corroborating to the arguments of Tissington and Senior (2011). On the other hand, this dichotomous view of a digital society, divided between immigrants and natives, has been criticised by Sanchez et al. (2011) and Bennett et al. (2008) who claim neither Digital Natives nor Digital Immigrants actually exist. They both maintain that students today, young and old, are equally comfortable with technology although primarily use it for social interactions rather than for learning purposes and self-development. Furthermore, it has also been suggested that there is not a significant distinction between Digital Natives and Digital Immigrants rather that Digital Natives tend to engage with new technologies more deeply and more efficiently (Kennedy et al. 2008). Ultimately, the main difference between Digital Natives and Digital Immigrants is that the latter are more likely to use technology for learning and the former for social interaction (Kennedy et al. 2008). There are a number of disagreements between academics regarding these definitions with a lack of empirical evidence for their existence cited (Bennett et al. 2008)

In order to better understand the digital literacies relationship in more detail, Coventry University has adopted the following framework which is organised into seven different literacies as can be seen in Figure 2 below:

Figure 2: Digital Literacies Framework

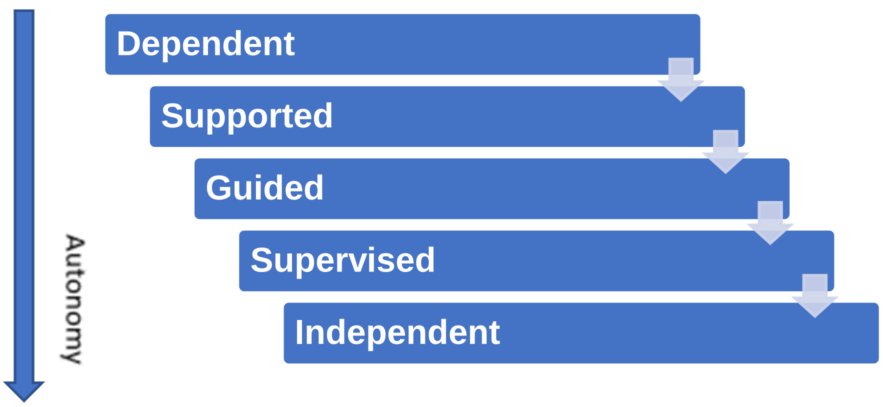


Source: JISC (2015b)

As can be seen above, there are seven elements of digital literacies that Coventry University's TLA strategy seeks to develop. These include media literacy, communications and collaboration, career and identity management, Information and Communications Technology (ICT) literacy, learning skills, digital scholarship and information literacy. Media literacy is articulated as the ability to critically read and creatively make professional material via a range of different forms of media such as creating a YouTube video in a seminar after incorporating individual or group critical analysis on a given topic. Communications and collaboration are defined as participation in digital media (such as the use of appropriate databases) for learning and research purposes. Career and identity management refers to students managing their digital reputation and online identity appropriately and professionally through platforms such as Facebook and Twitter. ICT literacy means adopting, adapting and using digital devices, applications and services to further understanding. Learning skills are described as the competence to study informally and formally in technology-rich environments. Digital scholarship explains the extent to which learners engage in academic, research and professional practices that utilise digital systems. Finally, information literacy is concerned with the ability to find, interpret, evaluate, manage and share information with others.

Each of these literacies is divided into five ability ranges to demonstrate progression as can be seen in Figure 3 below. The ideal scenario in terms of increasing digital literacy competence in students is to encourage more independent rather than dependent learning:

Figure 3: Digital Literacies progression



Source: JISC (2015b)

Digital literacy in students and academics has evolved greatly in recent years with its effect on HE viewed as profound and everlasting by many scholars. For instance, hardware in the form of Learning Management Systems (LMS) and tools such as email and mobile phones are now a common aspect of the UK HE landscape (Kirkwood and Price 2005: 265). Although there are now many more possibilities to incorporate technology into teaching, there has been a lack of evaluation of the technologies that are commonly used. For example, UCISA (2018: 1) found:

> *'The evaluation of staff pedagogic practices is at its lowest level since 2012 and has most commonly focused on a general review of TEL services, determining the take-up and usage of TEL tools across an institution'.*

Considering UK HEIs have made extensive investments into TEL (Sharpe 2018), and learning analytics are growing in popularity (JISC 2018a) this lack of evaluation is rather surprising. Indeed, as Clarke et al. (2001: 169) state, there is generally little understanding regarding the effectiveness of technology in connection to student learning with its value more linked to the structure of a particular course:

> *'Professors are using various educational technology tools to assist learning in their classes. However, little is known about students' perceptions of how these unique teaching tools influence their overall experience'.*

Unfortunately, previous lesson observations and student feedback has demonstrated that there is minimal understanding at CUL whether the learning technologies that are used inside and outside the classroom are actually helpful in improving existing classroom practices as articulated by Sharpe and Benfield (2004: 3).

Therefore, this study aims to provide constructive solutions to enable both students and academics to better understand and effectively use learning technologies. The temptation to paint learning technologies as a panacea that can transform student and academic engagement will be avoided with both their strengths and weaknesses examined throughout the thesis. Indeed, it is asserted that learning technologies may not work for every student in UK HE, as discovered by Sharpe et al.'s (2009) JISC-funded learner experiences research, and that they are not 'magical pixie dust that can cure all teaching ills' (JISC 2017d: 1).

As a result, this thesis will operate from an objective, rather than 'techno-positivist[5]' standpoint. Indeed, 'techno-positivist' arguments have endured criticism from various academics for their lack of understanding of historical contexts (Selwyn 2011), insufficient appreciation of political and social environments (Hall 2011), lack of attention to inequality in technology use (Livingstone 2012) and over-emphasis on technology determinism and theory (Oliver 2011). It is vital to possess an open mind when advocating the use, acceptance and effectiveness of learning technologies in modern-day pedagogical research (Cousin 2005).

The title of the thesis is *'Applying the Technology Acceptance Model to ascertain the acceptance of learning technologies in international students and academics – a case study at Coventry University London'*. Arguably the key word in the title is *'acceptance'* – the aim is to identify how to improve the quality of the teaching that is offered and the student learning experience as a result by analysing the usage and acceptance of learning technologies at CUL. To accomplish this aim it is important to understand what influences technology acceptance in both students and academics[6].

This doctoral study explores the relationship between interactive learning technologies and acceptance for international postgraduate students, the largest student population in CUL. The project will consider how to reshape and reframe the current limited pedagogical discourse in order to better understand how the positive impact of learning technologies might influence students' progression, achievement and experience at CUL and ultimately in wider HE. Technology acceptance in academics will be analysed in order to discover the specific external variables that

[5] The belief that technology is wholly positive.
[6] 'Academics', 'Teachers' and 'Lecturers' will be used interchangeably throughout the thesis. The term 'Academics' will be used in the main as this encompasses the lecturing, seminar teaching and research components of the role.

affect acceptance with recommendations delivered on how to improve the student experience and the effectiveness of academic technology usage.

This study implements CGT, which utilises study phenomena in order to examine ‘how, when and to what extent … the studied experience [is] embedded in larger and, often hidden, positions, networks, situations, and relationships’ (Charmaz 2006: 130). A CGT methodology is seen as particularly beneficial in generating rich and meaningful findings by co-constructing data with students and academics via my unique institutional insider perspective. It is also arguably a valuable methodology in which to create theory from the engagement that will take place between myself and respondents (Charmaz 2006; Ramalho et al. 2015). Further justification for this approach will be explained in more detail in Chapter 4.

The next section provides more information on the institution being investigated in order to give greater context to the research.

1.3 Coventry University London

Coventry University London (CUL) was founded in October 2010 and now has over 18 different degree programmes. CUL is a teaching and learning-led institution in that it concentrates more on teaching rather than research (a ratio of approximately 75:25). Academics typically teach sixteen hours per week over three terms of eleven weeks. The remaining time is used to develop modules and courses, undertake continuous professional development (CPD), carry out research activities and take annual leave. One of CUL’s main objectives is to provide opportunities for learning that develops career-ready and global enterprising graduates. As mentioned, the vast majority of postgraduate students at CUL are international with the main campus in Coventry having more of a domestic and international mix (approximately 65% domestic students and 35% international students). CUL students tend to be attracted by the London location. Due to international postgraduate students being the most dominant population at CUL (from 2016-2018 they represented 61% of the total number of students on campus) they have been selected to participate in this thesis. This strategy was viewed as important in enhancing the reliability, validity and generalisability of the research process.

CUL is a part of the Coventry University Group[7]. Coventry University was named 'University of the Year' in the 2015 Times Higher Education (THE) Awards (Coventry University 2015) and was Ranked 13th in the Guardian University Guide 2019 (Guardian 2018). CUL promises to deliver ‘a real business experience’ for students (Coventry University 2015: 1). As can be seen on the university website, academics come from a range of countries with British, Chinese, Greek, German, Nigerian, Moroccan, Indian, Pakistani, Mauritian, Belarussian, Polish nationalities all represented on campus (Coventry University 2018).

Like many post-1992 universities, and despite its recent high university ranking, CUL arguably has a lesser reputation when compared to more established institutions. CUL tends to pride itself on the opportunities it offers to a wide variety of students. As a result, the findings from this research may be more suited to fellow post-1992 institutions and universities with a similar student and academic profile than members of the Russell Group[8]. This point will be discussed in more detail later in the thesis.

1.4 ‘Pedagogy’ or something else?

As the term ‘pedagogy’ is used throughout the thesis, it is necessary to provide an operational definition and explain its background. Pedagogy is a debated term with a number of academics claiming it to be unsuitable to use in HE due to its Greek origins meaning to teach children (Cannon 2001: 415; Ashton and Newman 2006). Conner (1997) instead proposed the use of the word ‘andragogy’, which is defined as the art of enabling adults to learn. The word ‘heutagogy’ (self-determined learning) has also been suggested by Hase and Kenyon (2007: 2) who state this term is more suitable for the present day.

Although there are merits in the definitions of both andragogy and heutagogy (particularly the former due to adults being taught in HE) pedagogy has become an accepted term in the literature for teaching and learning in HE, despite it being something of a misnomer (Kirkwood and Price 2005; McLean 2006; Stierer and Antoniou 2004). Therefore, ‘pedagogy’ will be used throughout this thesis with its

[7] An umbrella term for all locations owned and governed by Coventry University.
[8] A group of 24 established UK universities with a shared focus on research.

meaning construed as developing individuals to think rationally and independently (McLean 2006).

The research aim, strategies and research questions are now discussed in order to identify how the research gap can be filled.

1.5 Research Aim

The thesis aims to fill the gap in understanding how and why technology acceptance can improve teaching effectiveness and student performance at Coventry University London and provide solutions for the institution and wider HE. In order to accomplish this aim, The Technology Acceptance Model (TAM) is applied to ascertain technology acceptance in students and academics. The decision to use TAM centred on its flexibility to be applied to different research contexts, its potential to include further variables related to human and social change processes as well as its capacity to construct innovative models (Legris et al. 2003). A CGT methodology is employed as discussed in 1.2 above in order to generate rich and meaningful findings through the co-construction of data with students and academics via several targeted qualitative methods including interviews, focus groups and participant observation. The use of a suite of qualitative methods is argued as helpful in enhancing validity and meeting the research gap via method triangulation (Carter et al. 2014). The specific methods used are discussed below, outlined in 1.6 and justified in more detail in Chapter Four.

There are four research questions in this thesis:

1.5.1 Research Questions

1. ***To what extent do external variables have an impact on technology acceptance in students?***

Both literature reviews (Chapters Two and Three) explore in detail the specific external variables that influence technology acceptance in students. Six particular variables are critically discussed and examined in this research question. Students will be interviewed and participate in focus groups in order to answer this question. Contributions from learning technologists will also be taken into account. The findings for this question are displayed in Chapter Five and discussed in detail in Chapter Seven.

2. ***In what way do external variables have an impact on technology acceptance in academics?***

Chapters Two and Three investigate particular external variables, which influence technology acceptance in academics. Six particular external variables that affect technology acceptance in academics are analysed in this research question. Interviews with academics will take place as well as a focus group with learning technologists and interviews with senior management. Chapter Six presents the findings for this research question followed by a discussion in Chapter Seven.

3. ***To determine the reasons why specific learning technologies facilitate greater acceptance in students and academics.***

A number of specific learning technologies and technological platforms are critically examined in Chapter Two in order to discover the reasons why they facilitate acceptance in both students and academics. These technologies are structured by the HEA's definition of TEL - 'personalised learning', 'flexible socialisation' and ‘flexible learning’ (Gordon 2014). The category on ‘flexible learning’ is also linked to the arguments Barnett (2014). In addition, the specific learning technologies that are integrated into this thesis are connected to eminent learning theories and will be discovered after applying several qualitative methods (interviews with academics, academic lesson observations, interviews with students, focus groups with students and a focus group with learning technologists) and after theoretical saturation has taken place in the CGT process. Chapters Five and Six present the findings to this question followed by a discussion in Chapter Seven.

4. ***How do students and academics differ in their attitudes to the Perceived Usefulness and ease of use of learning technologies?***

Chapters Five and Six concentrate on understanding in what ways students and academics differ in their attitudes to the PU and ease of use of learning technologies. The results for this question will be discovered after interviews with students, focus groups with students, a focus group with learning technologists, interviews with senior management and academic lesson observations. The differing attitudes of students and academics are discussed in detail in Chapter Seven. Both student and academic attitudes to the PU and ease of use of learning technologies are critically examined using TAM in Chapter Three.

1.6 Research process

The research process was conducted over three years (2016-2018) in order to capture technology acceptance in students and academics over a sustained and suitable period of time (please see the specific details in Table 2 overleaf). This strategy was viewed as important in order to keep pace with the evolving nature of learning technologies:

Table 2: Data collection timeline

Data collection period	Qualitative methods employed
2015	1. Pilot study
2016	1. Interviews with academics 2. Academic lesson observations 3. Interviews with students 4. Focus group with students
2017	1. Interviews with academics 2. Academic lesson observations 3. Interviews with students 4. Focus group with students 5. Focus group with learning technologists
2018	1. Interviews with senior management

A pilot study was carried out initially to ascertain the relevance of the interview questions. The overall research process follows the approach in Table 3 on page 38 and demonstrates how specific qualitative methods are connected to each research question. Specific justification regarding the use of each method will follow in Chapter Four.

Table 3: Data collection process

Pilot process to inform the data collection strategy

RQ 1: To what extent do external variables have an impact on technology acceptance in students?
Interviews with students.
Focus groups with students.
Focus group with learning technologists.

RQ 2: In what way do external variables have an impact on technology acceptance in academics?
Interviews with academics.
Focus group with learning technologists.
Interviews with senior management.

RQ 3: To determine the reasons why specific learning technologies facilitate greater acceptance in students and academics.
Interviews with students.
Focus groups with students.
Focus group with learning technologists.
Academic lesson observations.
Interviews with academics.

RQ 4: How do students and academics differ in their attitudes to the Perceived Usefulness and ease of use of learning technologies?
Interviews with students.
Focus groups with students.
Focus group with learning technologists.
Interviews with senior management.
Academic lesson observations.

1.7 Areas of contribution

As will be discussed in more detail later in thesis, it is maintained that this study has contributed to knowledge on the subject of technology acceptance in three different ways. First of all, this is the first CGT study in a UK university setting using TAM that has discovered the importance of PEOU in academics in contrast to the influence of PU in students. CGT was particularly helpful in generating the information needed to answer each research question. It is affirmed that it would not have been possible to have uncovered the rich, detailed and specific data required on technology acceptance had another approach been applied.

Secondly, the Student and Academic Technology Acceptance Model (SATAM) has been created as a result of this research and demonstrates that there are six specific external variables which influence technology acceptance in students and six others in academics. This framework has developed a new way in understanding the differences in technology acceptance between students and academics. This framework is arguably useful in explaining the particular external variables that affect technology acceptance for the institution. This is especially important so the university is able to re-adjust its pedagogical strategy in order to maximise the substantial investment it has made. It is also asserted that SATAM is a flexible model that can be applied to other institutions to ascertain what particular variables affect technology acceptance in students and academics. However, it is affirmed that SATAM may be more suited to post-1992 universities and similar London-based institutions due to the type of students and academics involved.

Finally, ‘Employability’ is found to be an influential variable in SATAM and demonstrates the importance of learning technologies being perceived to be useful in securing work and being able to be replicated in future employment. This discovery ostensibly highlights the need for the institution to create a pedagogical strategy that better focuses on improving student employability through learning technologies. This recommendation is especially important in order to prepare students for an uncertain, disruptive future where technology likely to become even more pervasive.

1.8 Chapter One summary

Chapter One has provided a rationale for the significance of the study and has articulated that there are a lack of studies that take technological acceptance from both academics and students in UK HE into account. The chapter discussed that there was a gap in the research, as studies on technology acceptance in UK HE have yet to demonstrate the effectiveness of learning technologies in helping students achieve learning gains. After that, Chapter One examined the evolution and importance of Higher Education (HE) in improving society. The link between the influence of learning technologies and their role in meeting student expectations and outcomes was then articulated. The profile of Coventry University London was elucidated in order to provide greater context for the research. The research aim, strategies and questions were justified, focusing on how each question could address the research gap discussed at the start of the chapter. Finally, the chapter concluded by examining the unique contributions to knowledge that emerged from the thesis.

1.9 Thesis structure

The remainder of the thesis is separated into seven further chapters.

Chapter Two examines the topic of contemporary learning technologies in significant detail; critiquing current pedagogical approaches and analysing the extent to which particular learning technologies are beneficial or detrimental in enhancing technology acceptance. Chapter Two utilises aspects of the HEA’s definition of TEL - ‘personalised learning’, ‘flexible socialisation’ and ‘flexible learning’ (Gordon 2014) to inform the selection of the learning technologies that are critiqued. The attitudes, capabilities and effectiveness of students and academics in relation to specific learning technologies will also be explored in detail in this chapter.

Chapter Three analyses a number of theoretical frameworks and discusses their relevance to the thesis. This chapter follows a lineal, chronological structure; beginning with the evolvement of technology acceptance from the past to the present day with the focus on TAM and its associated contemporary extensions. This structure is contended as useful in demonstrating how technology has evolved and why TAM is ultimately the most suitable framework to be adopted in this thesis.

Chapter Four discusses and analyses the philosophical position that subsequently informs the methodology being used. This chapter provides a rationale for the selection of qualitative methods and the use of CGT, vindicating it as the most appropriate methodology to be used in this research due to its ability to explore human experiences, generate theory and align with my own constructivist philosophical beliefs.

Chapter Five presents findings from the student perspective from the interviews and focus groups. The results indicate that there are six different external variables which affect technology acceptance in students.

Chapter Six presents the findings from the academic team, mainly focusing on responses from the academic interviews, which were conducted over a two-year period (2016-2017). In addition, this section also includes findings from the academic lesson observations over the same duration as well as the focus group with learning technologists and interviews with senior managers. The latter two qualitative methods focus on providing recommendations for the institution and wider HE on how to enhance technology acceptance in both students and academics.

Chapter Seven discusses the results from Chapters Five and Six in order to identify if CUL's TLA strategy is able to deliver the 'real business experience' it promises through the use of TEL to its students. Specifically, this chapter analyses the extent to which a number of specific external variables have an impact on technology acceptance in students and academics. To accomplish this aim, the reasons why particular learning technologies facilitate greater acceptance in students and academics are critically examined and a discussion is presented on how students and academics differ in their attitudes to the PU and ease of use of learning technologies. Relationships to relevant empirical research and theoretical frameworks from the literature review are also critically evaluated and debated throughout this chapter. Chapter Seven also presents SATAM; the conceptual framework that has been created as a result of this research. The development of the framework is discussed followed by a detailed analysis on how it works in practice. The limitations of the framework are also examined.

Chapter Eight provides a conclusion to the thesis and answers each of the research questions in detail. Contributions to knowledge are provided as well as an examination of a number of limitations specific to the study. The chapter and thesis finishes by delivering recommendations for future research.

Chapter Two – Literature Review Part One - Empirical Research

2.0 Introduction to Chapter Two

Chapter Two provides a detailed analysis of the empirical research surrounding the importance of learning technologies from both a student, academic and institutional perspective. This chapter delivers a comprehensive overview of the salient issues and acts as a prelude to Chapter Three, which critically evaluates a number of relevant technology-related frameworks in considerable depth.

The chapter begins by providing a definition of learning technologies in order to set the scene for the study. Learning theories are then analysed followed by a discussion on technology acceptance in HE, focusing on previous qualitative studies. The next part of the chapter analyses the impact of the current level of investment into learning technologies by UK Higher Education Institutions (HEIs) and how they are embedded into curricula. The chapter continues by evaluating the various issues associated with learning technologies from both a student and academic perspective. A critique on the effectiveness of common tools used by both students and academics at CUL and their impact in facilitating technology acceptance is then given. This section is informed by the Higher Education Authority's (HEA[9]) definition of TEL (Gordon 2014) and Barnett's (2014) analysis of flexible learning. The learning theories evaluated earlier in the chapter are all applied in this section. First, several definitions of learning technologies and related terminologies are provided in 2.1 on page 45.

[9] The HEA merged with the Leadership Foundation and the Equality Challenge Unit to form 'Advance HE' in 2018. This particular article was from the HEA and authored by Gordon (2014).

2.1 Definition of learning technologies

Rist and Hewer (2016: 1) describe learning technology as:

> *‘The application of technology for the enhancement of teaching, learning and assessment. Learning Technology includes computer-based learning and multimedia materials and the use of networks and communications systems to support learning’.*

Similarly, Kirkwood and Price (2014) focus on ‘enhancement’ while adopting the term ‘Technology Enhanced Learning’ (TEL) when describing the application of learning technologies that are used in teaching and learning. However, Kirkwood and Price (2014) ascertain there is no clear definition of TEL with the actual meaning often dependent on the context and environment in which learning takes place. In addition, Bayne (2015) maintains that TEL has failed to understand its own ontological biases meaning that its definition is largely unclear. Bayne (2015) adds that there is no real understanding of what it is able to accomplish due to there being little critique of TEL-related literature. Arguably, this is a valid criticism and HEIs such as CUL do not appear to have a clear understanding of how learning technologies positively affect technology acceptance (Bayne 2015; Biesta 2015). This is rather surprising as the effectiveness of learning technologies have been thoroughly debated and researched with a great deal of investment made into embedding them into the curriculum (Kirkwood and Price 2014).

The Higher Education Funding Council for England (HEFCE) (2009: 1) provide their own definition of TEL as ‘enhancing learning and teaching through the use of technology’. Although this definition, like the others above, can arguably be regarded as rather general and lacking in specifics, particularly in identifying what ‘enhancing’ actually refers to, HEFCE adds that there are three tangible benefits associated with TEL. As can be seen in Table 4 overleaf these are:

Table 4: Benefits associated with TEL

1. **Efficiency –** technology allows existing processes to be delivered in a more cost-effective, sustainable and ultimately timely manner. 2. **Enhancement –** technology possesses benefits in increasing the quality of common processes and their subsequent outcomes. 3. **Transformation –** technology is able to transform existing processes and contribute to meaningful and sustainable change.

Source: HEFCE (2009)

Indeed, Smith and Oliver (2002) and Kirkwood and Price (2014) argue that university leaders are predominantly interested in the efficiency benefits of technology, especially if it helps to reduce costs, improves student numbers, provides a competitive advantage against other institutions and meets the learning expectations of students.

To help us understand how students learn and in what way universities such as CUL can utilise TEL in order to meet student learning expectations, a critical examination of a number of relevant learning theories is provided below:

2.2 Learning theories

It is maintained that all modern universities must effectively utilise learning technologies in order to effectively engage students in the curriculum (Beetham and Sharpe 2007; Laurillard 2013). One way to understand if technology enhances student learning is to apply learning theories. These have evolved over the past century with pedagogical principles such as Instructionism, Constructionism, Socio-cultural learning and Collaborative learning all influencing modern-day thinking.

Instructionism is based on the theories of Gagné (1970; 1997) and Merrill and Twitchell (1994) and looks at how a teacher presents in a classroom environment (such as conveying information to students by PowerPoint) as well as providing corrections on student performance in various tasks. As Merrill and Twitchell (1994) explain, Instructionist strategies tend to be teacher-focused and are usually lacking in student interaction.

On the other hand, Constructionism focuses on students’ activity within the classroom. Activities are adapted by teachers in order to meet the needs of their learners. Moreover, in Constructionism, teachers deliver developmental intrinsic feedback to students which is able to facilitate reflection on performance that has been formed by their current understanding (Laurillard 2009). This pedagogical style is more focused on generating interaction with students when compared to Instructionist principles.

On the other hand, Socio-cultural learning identifies how students exchange ideas with a classmate or classmates with the teacher pivotal in initiating discussion (Laurillard 2009). Socio-cultural learning is based upon the work of Vygotsky (1962) and focuses on the importance of discussions in learning (with interactive learning technologies often used as a conduit in accomplishing this aim). Arguably, social tools and interactive learning technologies enable the learning process to increase collaboration and develop a community of like-minded learners (Mason and Rennie 2008). Ackermann (2004) concurs when asserting that experiential learning via collaboration is advantageous in both enhancing knowledge as well as developing better working relationships and socio-cultural awareness. Similar to Laurillard’s (2009) definition above, this theory emphasises that learners create their own culturally specific resources and learn through acculturation rather than by acquisition. Moreover, by identifying the experiences that are formed during learning and thinking, individuals are able to construct solutions for solving problems and making decisions. The ability to create such an environment can increase learner motivation, acceptance and better collaboration (Conole 2008).
As Laurillard (2009) explains, Collaborative learning has evolved from the work of both Vygotsky (1962) and Piaget (1977) in order to include the Social and Constructionist aspects of the learning process. In Collaborative learning, technology can be used to facilitate these aspects (Dillenbourg 2008; Bereiter and Scardamalia 2005). Collaborative learning includes valuable aspects such as negotiating, learning and building an identity (Lave and Wenger 2001). Learners participating in a community of practice are able to increase both their social and cultural

understanding. In addition, communities of practice that exhibit humour, social interaction and co-development of tasks tend to perform at an optimum level (Engeström 2007). Collaborative learning is arguably particularly effective when used in conjunction with Web 2.0 tools (Selwyn 2009) although the boundaries of these applications can be blurred between production and actual use (Bruns and Humphreys 2007). Nonetheless, it is argued that communities of practice formed by Collaborative learning are able to enhance the student experience in terms of cognitive, constructive, social and situative benefits as articulated by Mayes and De Freitas (2007).

Two further learning theories will now be discussed - Cognitivism and Constructivism with the latter being of particular relevance for this thesis.

Cognitivism can be defined as students expressing their own ways of thinking and ability to argue a point. This theory includes a learner's ability to reflect upon a subject then articulate their own thoughts, which is seen as beneficial in developing self-awareness (Chi 2000). For instance, publishing on social media platforms such as Facebook or Twitter or utilising a blog to convey reflection are examples relevant to TEL. This is because they are helpful for students in accessing and disseminating greater amounts of data and ultimately introducing more variety that would be otherwise challenging to develop as an individual (Mejias 2006).

In many ways, Constructivism can be regarded as similar to Constructionism although the former is an educational cognitive theory invented by Piaget with the latter more of an educational method developed by Papert and based upon Constructivist learning theory. According to Piaget, Constructivism studies the manner in which individuals engage in various tasks and how these change over time (such as how students and academics engage with learning technologies during a specific timeframe). As Hamir et al. (2015: 1) explains:

> *'Constructivism is a theory of learning based on experience and observation. Through experience, and reflecting on these experiences, individuals construct their knowledge and understanding of the world'.*

It is contended that Constructivism has been a key academic learning theory for many years although the evolvement of learning technologies has witnessed new forms of Constructivism emerging. Arguably, these new forms of Constructivism include social networking platforms (such as Facebook and Twitter) which are able to enhance a Social Constructivist learning style by engaging users deeply in social networks where users are able to practice and develop their problem-solving skills (Dalsgaard 2006). It has also been suggested that the Cognitive Constructivist and Social Constructivist approaches should be combined in order to increase the social benefits of pedagogy (Felix 2005). Nonetheless, it appears that the Social Constructivist approach focuses on the social and cultural aspects of cognition whereas the Cognitive Constructivist approach concentrates on the cognition that forms in the mind of the learner who then makes sense of their own thoughts (Felix 2005). Moreover, interactions that occur online (such as in a Moodle or Blackboard discussion forum) lead to knowledge being constructed in an individualistic way but are also mediated socially by other users. As the OECD (2009) assert, students tend to learn more effectively by solving problems themselves and the actual thinking and reasoning in Constructivism is arguably of greater importance than the curriculum being studied.

Developing students as independent learners is a key aspect of academics' jobs at CUL and in other HEIs (McCabe 2014). Indeed, social tools and interactive Web 2.0 learning technologies can facilitate independent learning and enable students a greater degree of personalised exploration into a particular subject (Mason and Rennie 2008). Social Constructivism states that it is vital for the learner to be appropriately engaged and actively involved in the process of learning. The Constructivist philosophy particularly resonates as CUL's teaching, learning and assessment strategy involves both facilitating individual inquiry as well encouraging students to find their own solutions to issues through active learning. Despite pedagogical strategies such as these being employed to build student engagement, a number of issues remain as will be discussed in 2.3 below.

2.3 Student issues with learning technologies

Although there are a wide variety of benefits associated with learning technologies and their impact on student motivation and engagement, as Selwyn (2016) comments, there are a number of negative aspects, which are now examined. For instance, Selwyn (2016) surveyed 1658 undergraduate students at two Australian universities and discovered that there were four central issues associated with the acceptance of learning technologies as can be seen in Figure 4:

Figure 4: Student issues associated with learning technologies

Source: Selwyn (2016)

As can be seen above, learning technologies can be construed as distracting, disruptive, difficult and sometimes detrimental (Crook 2002) with laptops and other electronic devices occasionally found to be less effective in aiding student retention than paper and pens (Bothwell 2017). Technologies such as smartphones and

YouTube can be seen by students as overly distracting and resulting in increased levels of procrastination (Selwyn 2016). Moreover, having unrestricted access to the internet is viewed by many students as another distractor due to the temptation to relax and engage in surfing for non-studying purposes (Dolch and Zawacki-Richter 2018). Facebook is often viewed as particularly tempting and distracting. Indeed, social media in general is regularly identified as the biggest distractor in class (Donlan 2014) with some students compelled to join in after witnessing others participating (Selwyn 2016). Students can also encounter frustrations with poor internet connections and low battery life as well as incomplete videos provided by academics and unreliable university systems at busy times such as when assignments are due to be submitted (Selwyn 2016).

Difficulties regarding the portability of laptops is another issue observed by Selwyn (2016). Students can complain of the inconvenience of carrying around large devices to lectures and seminars. Headaches and a potential negative impact on well-being can be experienced by students who spend a lot of time using the internet every day (Dutta 2017). Navigating VLEs has been cited as an additional source of frustration due to inconsistencies with the quality and amount of information offered (Selwyn 2016) with only 40 per cent of UK HE students satisfied with the collaborative features of VLEs (JISC 2017b).

The final issue concerns the reduction in quality of the student experience due to weaknesses with technology. For instance, students can be unhappy with the perceived poor quality of learning materials (Selwyn 2016). A particular criticism has been levied at flipped classes[10], which are often seen to be created hurriedly, and without sufficient thought or quality (Taylor 2015). An additional issue can be the lack of engagement in PowerPoint slides. Teachers have been criticised for reading from the slides and not engaging with the class. PowerPoint sessions can be viewed as boring, repetitive and occasionally demotivating. Moreover, the use of PowerPoint has been observed as overly formulaic and lacking in personalisation. Ralph (2017) even suggests universities should ban PowerPoint as it makes lectures boring and stifles critical thought. Students have also been found to be unhappy with the use of

[10] Teachers shifting direct learning out of the large group learning space and moving it into the individual learning space, with the help of one of several technologies (Hamdan et al. 2013: 4). This is discussed in more depth in 2.11.

Moodle discussion forums, which can be seen as disconnected and lacking in stimulus (Selwyn 2016; Estacio and Rizal 2017). Despite these criticisms, it is argued that learning technologies possess far more advantages than disadvantages and as discussed in the first chapter, have the potential to play a pivotal role in the engagement of both academics and students. This thesis seeks to understand more about this prospective relationship.

In order to investigate this subject in more detail, the next section examines the association between nationality and technology acceptance with particular reference paid to the linkage with socio-cultural learning strategies.

2.3.1 Nationality and acceptance of learning technologies

There are a number of definitions of nationality although it appears that there is no firm agreement on a common comprehensive meaning. However, the following examples are arguably helpful in providing greater context on nationality and technology acceptance in students. For instance, Hofstede (1994: 5) states nationality 'is the collective programming of the mind which distinguishes the members of one group or category of people from another'. Similarly, Matsumoto (1996: 16) argues it is 'the set of attitudes, values, beliefs, and behaviours shared by a group of people, but different for each individual, communicated from one generation to the next'. Moreover, Spencer-Oatey (2008: 3) articulates:

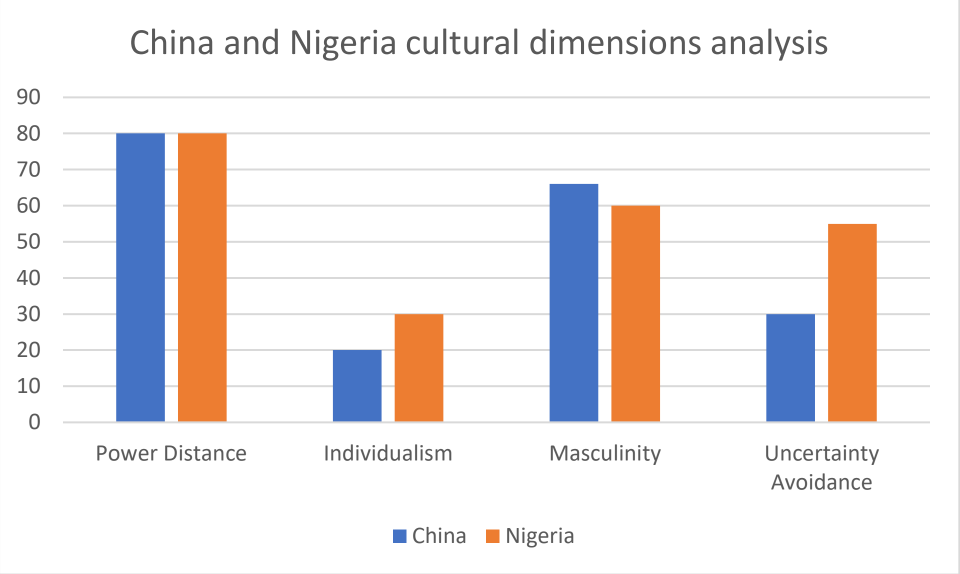
> *'Nationality is a fuzzy set of basic assumptions and values, orientations to life, beliefs, policies, procedures and behavioural conventions that are shared by a group of people, and that influence (but do not determine) each member's behaviour and his/her interpretations of the "meaning" of other people's behaviour'.*

As can be seen in the three quotations above, nationality can arguably be defined as a combination of shared attitudes, beliefs, values and behaviours that are adopted by a particular group of individuals. It is therefore important for academics to be able to differentiate their pedagogical practices to complement the attitudes, beliefs, values and behaviours of the students they teach. As

Laurillard (2013) states, it is vital for teachers to keep up to date with learning technologies so that they can effectively respond to students' various socio-cultural learning styles.
Thus, the following section will analyse the effect to which nationality is pervasive in accepting, adopting and ultimately flourishing when using learning technologies both inside and outside the classroom. This segment predominantly focuses on Chinese (42% of total students at CUL) and Nigerian nationalities (19% of total students) as these are the two most dominant student populations on campus and were most referenced during the CGT data collection process. As will be subsequently discussed, Chinese students' perceived self-effectiveness regarding their own IT literacy as well as the PU has a strong correlation on their decision to accept and use a particular technology (Chang et al. 2011). Similar findings have been discovered in Nigerian students who are generally more likely to be influenced by the PU of a particular technology (Kabir et al. 2017).

Although rather antiquated and limited due to being conducted only at only IBM offices in 1980 (Jones 2007) and restricted in terms of the number of dimensions that it uses, Hofstede's (2001) research on cultural dimensions is arguably an appropriate framework in which to apply technology acceptance in different nationalities. Indeed, it is contended that there are four cultural dimensions that can be applied to technology acceptance – power distance, individualism, masculinity and uncertainty avoidance as can be found in Figure 5 on the next page:

Figure 5: Hofstede's Cultural Dimensions (China and Nigeria)



Source: Based on Hofstede (2001)

2.3.1.1 Power Distance on technology acceptance

Power Distance is defined by Hofstede (2001) as the extent to which less influential members of a population perceive that power is distributed unequally. Societies with a high degree of power distance may see individuals deciding not to use media (such as email) with those in positions of power (Straub et al. 1997). Social norms often have an influence on the decision to use a particular form of media with workers in societies with lower power distance generally having more confidence in contacting senior figures by electronic means.

China and Nigeria are countries with high power distance: they both have the same score of 80 when the average is 64 (Hofstede 2001). This means that they may be reluctant to use particular technologies (such as sending emails to academics) if they perceive the power distance relationship to be overly high.

2.3.1.2 Individualism and technology acceptance

This dimension is explained as the degree of interdependence a society possesses within its population (Hofstede 2001). A low level of individualism can reduce the level of technology acceptance (Straub et al. 1997). This is because people from collectivist societies (such as China) are generally unable to understand cues regarding social situations from computer-based media when compared to other nationalities who are usually able to attain a deeper and more sophisticated understanding (Straub et al. 1997). Chinese students tend to be collectivist in their learning styles and can often be passive and observational when participating in class (Issa 2014). Indeed, in a study of Chinese and American students, Issa (2014) analysed how technology was perceived using Davis et al.'s (1989) Technology Acceptance Model. The study discovered that Chinese students generally adopted a Confucianist approach (particularly by demonstrating respect for authority) when it came to using Twitter in their studies. Instead of initiating dialogue like their American counterparts, Chinese students were content to observe and not question the relevance and validity of the technology being used. On the other hand, Levy (2007) asserts that learning technologies play an important role in improving collaboration between nationalities and in reducing power distance as they are able to act as a conduit in engaging various nationalities in the same lesson content as well as preparing them for the global workplace. Nigerian students can be regarded as low in terms of individualism with a score of 30 (Hofstede 2001) and tend to have low IT literacy levels, which can negatively affect technology acceptance (Folorunso et al. 2006).

2.3.1.3 Masculinity and technology acceptance

It has been found that highly masculine cultures may alter the extent to which technology is accepted (Straub et al. 1997) as a high Masculinity score means a society is focused on competition, achievement and success (Hofstede 2001). Media which is not capable of accurately communicating the social presence of the communicator may not be popular in highly masculine cultures (Straub et al. 1997). In Nigeria, which registers relatively high on the scale with a score of 60 (Hofstede 2001), students generally have an optimistic attitude towards technology adoption due to its positive perceived benefits for coursework via PU and PEOU (Adewole-Odeshi 2014). China is another masculine culture with a score of 66 (Hofstede 2001). It can also be contended that Chinese students are also influenced by PU and

PEOU although ‘guanxi[11]‘ and ‘mianzi[12]‘ can affect both of these dimensions (Lisha et al. 2017).

In less masculine cultures, it can be maintained that face-to-face media is not as important as the overall message that is conveyed (Straub et al. 1997).

Straub et al. (1997) conducted a study on technology acceptance in three different nationalities – Japan, Switzerland and The United States using TAM. These countries were selected due to the different results they had using Hofstede’s framework. It was discovered that TAM was an accurate predictor of technology acceptance in Switzerland and The United States although not in Japan (Straub et al. 1997). PU was discovered to be significant in Switzerland and The United States; however, PEOU was not as influential. This finding may be due to PEOU becoming less important over time as well as the fact that PEOU has more of an indirect impact on deciding to use a particular technology (as it influences the PU of a system or media).

2.3.1.4 Uncertainty Avoidance on technology acceptance

Uncertainty avoidance is regarded as the extent to which members of a particular population feel uncomfortable with ambiguity (Hofstede 2001). Arguably, this dimension could affect technology acceptance as certain members of a society may prefer traditional forms of media (i.e. they prefer to use media that they know) rather than computer-based media, which they may not have used before. Furthermore, Media Richness Theory as articulated by Balaji and Chakrabarti (2010) can also be linked to uncertainty avoidance. For instance, for complex tasks, individuals may decide to use rich channels (such as face-to-face discussions) whereas for tasks that are less ambiguous and uncertain, simpler channels (such as email) may be selected. China has low levels of uncertainty avoidance (30) and can be regarded as being comfortable with ambiguity, although Nigeria has a score of 55 meaning Nigerian students may be more likely to use media that they know when compared to Chinese students (Hofstede 2001).

[11] Networks and connections that help create new business-related relationships.
[12] Reputation in front of others.

The next part of this chapter moves on to analyse the importance of the relationship between learning technologies and student employability.

2.4 Learning technologies and student employability

As JISC (2017b: 1) contends, learning technologies offered by UK HEIs are viewed as important by 81.5 per cent of students for their future career although there is concern regarding how effective their classes are in preparing them for employment:

> *'While 81.5% of university students feel that digital skills will be important in their chosen career, only half believe that their courses prepare them well for the digital workplace'.*

In order to prepare students for their future career, it is essential that students experience a variety of current and appropriate learning technologies in authentic contexts to enhance their digital skills. JISC (2018b: 1) describes digital skills as 'crucial' in developing student employability. It is critical that teachers are able to use technology to create meaningful experiences that can be applied to real-life scenarios although this is viewed as challenging to accomplish as it may require a change in teaching beliefs and pedagogical style (Ertmer and Ottenbreit-Leftwich 2010). It is also vital that academics connect technology with real experiences so that they can effectively support their students (Beetham 2015). However, JISC's (2017b: 1) student digital experience survey discovered that technology is not effectively connected to the curriculum in the vast majority of UK HEIs and there is 'an apparent mismatch between the skills required by employers and those that students are familiar with, or believe are necessary'.

Indeed, the QAA's 2012-2013 research into student expectations and perceptions of technology usage in UK HE found there was a great deal of disappointment in the quality of learning technologies that were offered. In addition, it was discovered that students are dissatisfied with a lack of infrastructure, access to resources and academic effectiveness when using and applying learning technologies (Kandiko and Mawer 2013). JISC (2017b: 1) add that 'we need to be concerned about the almost 20% of learners in HE who do not feel digital skills to be relevant in their chosen careers. Since we know that around 90% of all new jobs require good digital skills, there must be a question mark over the workplace awareness of these learners, and perhaps of their teachers.' This is an issue that needs to be addressed with the acquisition of digital skills important for both students and academics. As JISC (2017b: 1) assert:

> *'Incorporating opportunities to embed digital skills into the curriculum (as well as technology into the delivery), doesn't only improve the experience for learners, it also enhances the professional development of staff. The digital capabilities of staff are key in order to pass on the relevant digital skills to learners, to improve their employability.'*

It is evident that digital capabilities have become increasingly essential in improving student employability and retaining work (Beetham 2015). As JISC (2017a) state, student employability can be enhanced in five different ways. These areas include the development of authentic learning experiences, helping students to engage with employers (both in person and virtually), developing students' lifelong learning and employability skills, using technology for employability and development and helping to develop students' digital literacy. It is contended that any university's learning technologies provision should be able to meet these five objectives. However, as Kandiko and Mawer (2013: 34) contend:

> *'The sense that some academic content might be "out-of-touch" with industry, both in terms of subject content and guidance on employability, is a concern of particular note when taken in tandem with the recognition that the majority of students indicated their purpose of study was to advance their career'.*

As mentioned in the introduction, the link between the effectiveness of learning technologies and their connection to future employability is pervasive throughout UK HE and particularly relevant to CUL due to its mission statement of promising ‘a real business experience’. Taylor’s (2018) study at CUL confirmed these findings when discovering that students were much more likely to accept a particular technology if it had positive perceived benefits in enhancing future employability. This research also illustrated the importance of CUL improving the consistency of its current learning technologies provision and creating a work environment where academics were able to effectively deliver the employability skills that students needed.

The next part of Chapter Two focuses on university investment and analyses academic issues with learning technologies.

2.5 University investment and academic issues with learning technologies

There has been substantial investment by HEIs with many universities innovating with technology in order to attain a competitive advantage and others seeking to simply keep up (Walker et al. 2014). Indeed, by 2014 it was reported that every university in the UK used a VLE (predominately Moodle or Blackboard) and were investing into further technologies to maintain student expectations and increase the quality of their offerings (Walker et al. 2014). Investments have been made into areas such as online assessment, plagiarism detection (Baker et al. 2011), blogs (Churchill 2009), e-portfolios and online collaborative tools (Ackermann 2004; Warburton and Perez-Garcia 2009). Universities have promoted the use of innovative learning technologies to their academics; such as Bangor University’s Centre for the Enhancement of Learning and Teaching (Bangor University 2018). Advances such as these have helped universities to keep pace with technological change and enhance communication, efficiency and engagement in both students and academics. Indeed, Walker et al. (2017: 4) go as far as to state:

> *‘With the increasing investment in centrally supported technologies, HE institutions have created the conditions for pedagogic innovation to flourish, enabling academics to employ technologies to support student-centred learning activities’.*

However, despite this considerable investment there is a perception amongst many academics that universities do not offer a clear and robust support strategy (Lai and Smith 2017). Universities have also been criticised for failing to involve students in the process of selecting appropriate learning technologies as well as seeking their views on what specific technologies have been most effective in increasing engagement and progression (Hartshorne et al. 2005). Issues such as these have negatively influenced technology adoption in some academics although others are more inspired by how technology can help students develop their employability skills and engage students more deeply in the lesson content (Sugar et al. 2004). Adoption of new forms of technology tends to be more likely if academics perceive that they are able to enhance the student learning experience (Roberts et al. 2007). Academics can arguably be categorised in two ways in regard to accepting and using learning technologies – those with a learning-design mind-set, with the ability 'to harness the potential of technology to improve teaching practice' (Persico et al. 2018: 978) and those who are positive and encourage others to experiment by passing on advice and success stories to colleagues. This definition contrasts to teachers who actively avoid using technology in their lessons as discussed by (Mumtaz 2000). Arguably, the more positive the attitude of the teacher and the greater familiarity they have with a technology, it is more likely that they will accept technology-related research and improve the quality of TEL in the classroom (Christensen 2002). On the other hand, academics who resist collaborating with peers and who do not actively participate in discussing new ideas and who do not reflect on positive and negative experiences with technology tend to be less successful (Hartshorne et al. 2005). Indeed, teachers who are pro-active with technology usually have less 'computer anxiety' compared to others who take less of an interest (Christensen 2002: 412). Lai and Smith (2017) additionally discovered that female and less-experienced teachers were more likely to accept and use technology in the classroom when compared to male and more experienced colleagues. Therefore, the decision to implement technology in the classroom can be reliant on the attitude and confidence of the teacher rather than the influence of the institution (Judson 2006; Beetham 2015). The decision to utilise technology as a tool to engage and motivate students can also depend on the philosophical and pedagogical beliefs of the teacher (Beetham 2015) with those following a

Constructivist philosophy generally being more confident and proficient in its use (Judson 2006).

There are further problems which restrict teachers' experimentation with learning technologies in the classroom. These issues include the complexity of Web 2.0, the relative lack of perceived benefits accrued from implementing technology when compared to traditional methods, a lack of opportunities to observe technology being integrated into classroom activities and a lack of symmetry with current pedagogical methods (Hechter et al. 2012). Steel and Hudson (2001) and Ertmer and Ottenbreit-Leftwich (2010) discovered that academic staff had a negative perception of technology and were reluctant to embrace technological change due to its continually evolving nature and their inability to keep up-to-date with recent developments.

Although the literature indicates that many universities utilise technology as a major part of their TLA strategies, institutions tend to organise ad-hoc workshops and training sessions rather than implementing an overarching strategy (Hartshorne et al. 2005). The current workshop model of teacher education can be criticised in that has been unable to foster sustained and impactful teacher learning (Hartshorne et al. 2005). The lack of a sustained and targeted strategy in addition to having a limited amount of time has resulted in only the most motivated and proactive teachers experimenting with learning technologies and collaborating their successes with their colleagues. This situation is arguably rather surprising with HE particularly dependent on the capabilities of its workforce in order to progress (Kinman et al. 2006). Indeed, a recent study by UCISA (2018: 1) discovered:

> *"Despite the investment in TEL services, we are not seeing major changes in the way that technology is being used to support learning, teaching and assessment activities".*

Another argument relevant to this debate is that there is a lack of development regarding technology as an accepted pedagogical method (Hartshorne et al. 2005). This problem may also stem from a lack of support with Hartshorne et al. (2005); Holley and Oliver (2009) and Beetham (2015) arguing the lack of time afforded to teachers by institutions may act as a deterrent to integrating technology into pedagogical strategies. Indeed, it is contended that a number of HEIs have been unsuccessful in supporting teachers with other priorities (such as maintaining projected levels of student recruitment) seen as more important (Hartshorne et al. 2005). BETT (2018) even claim that a lack of institutional support is widespread in UK HE. Issues such as these have palpably contributed to the inability of academics to apply current and recent pedagogical research in their lessons (Beetham 2015).

Furthermore, a decrease in the staff/student ratio has often led to higher workloads and more stress for many academics who are now required to be effective in the classroom, demonstrate excellence in research and to continually respond to the needs of students, often with few or limited resources (Davis 2003). The declining staff/student ratio has led to academics needing to spend more time on administrative duties with less time available for research and self-development. This situation has perhaps reduced the opportunity for academics to more consistently embed technology into teaching and learning practices and to develop as professionals (Lea and Callaghan 2008).

Land (2001: 9) created an integrated model of academic development, which seeks to connect specific forms of development with different groups of stakeholders. This model is arguably useful in encouraging reflection on competencies and in providing appropriate development to academics. However, as Blackwell and Blackmore (2003: 36) claim, there is no universal model for delivering academic development in UK HE due to the amount of diversity evident and the complexities of each academic development need. As will be discussed in Chapter Seven, the conceptual framework developed as a result of this thesis can be used to fill this gap. Nonetheless, the acquisition of new pedagogical skills (the skills required to use particular technologies) as well as the learning needed to become confident and proficient can be aligned to a Socio-cultural framework (Bruner 1996). Academics in this instance are able to adopt the role of learners in order to construct new ideas related to their current or previous knowledge with meanings originating from the culture in which they were made (Bruner 1996).

In addition to the issues discussed above, a pertinent concern for many teachers is that many technologies have not been developed for teaching purposes. Institutional pressure has seen academics attempting to shoehorn often irrelevant technologies into their teaching practices which have not enhanced student performance and subsequently reduced academic motivation to engage with technology in future classes (Koehler et al. 2011). Indeed, Selwyn (2016) discovered that students had an overall negative perspective regarding their teacher’s ability to use technology appropriately and effectively and were unhappy with distractions caused by their incompetence. Specific issues included teachers not being able to understand the technology they were using in lecture theatres, an ineffective use of YouTube in class and inability to understand how to use Smartboards. Students viewed these problems as a waste of time and money and questioned whether it was necessary to attend lectures (Selwyn 2016).

Although students are generally positive about the use of technology in their learning, as discussed previously, concerns have been made regarding several resources such as the quality of Wi-Fi access and the lack of desktop computers in universities, which a number of students rely upon (Newman and Beetham 2017). It is clear that university leaders must effectively manage their finances and priorities so that technology resource allocations are effectively aligned to organisational aims (Sharpe 2018).

In order for these organisational aims to be met, academics must possess a requisite level of IT skills to help students improve their IT competencies and employability skills (Beetham 2015). However, it has been discovered that students have little confidence in the IT skills of academics with just 15.8 per cent of respondents confirming they would contact their teacher for advice (JISC 2017b). Academics simply utilising a particular technology will not improve the effectiveness of the learning taking place. For instance, transplanting the same content to a PowerPoint slide from a lecture using an overhead projector will provide only a superficial delivery and create the pretence that technology is enhancing the learning experience whereas no real improvement has taken place (Fullan 2001: 37).

Consequently, Barnett (2014) introduced the ‘Conditions of Flexibility’ framework to inject new thinking, enhance the student learning experience and develop students for a fast-changing world. This framework can be seen in Figure 6 on page 64:

Figure 6: Conditions of Flexibility

Some materials have been removed from this thesis due to Third Party Copyright. Pages where material has been removed are clearly marked in the electronic version. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.

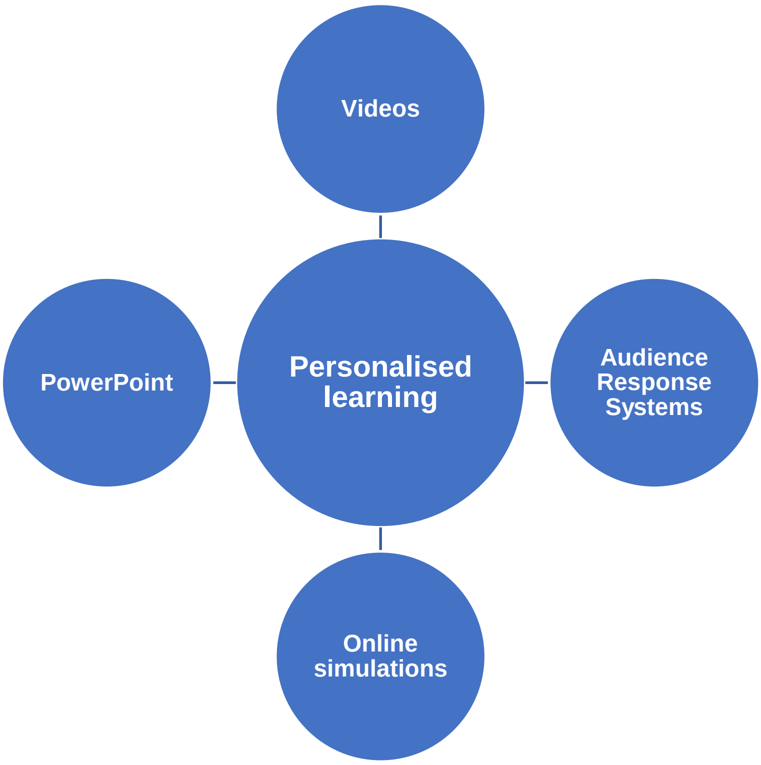
Source: Barnett (2014)

This framework is divided into four areas. Barnett (2014) elucidates Sector flexibility as students being able to enter HE at various entry points. Institutional flexibility is described as institutions responding to the needs and expectations of students. Learner flexibility refers to institutions offering students the opportunity to make decisions about their own learning experiences. Finally, pedagogical flexibility is concerned with the flexibility within the teaching and learning process and the freedom for academic staff to make their own pedagogical decisions. As Englund et al. (2016: 2) affirm, ‘how teachers conceptualise Edtech and the role of teaching has a significant impact on how they utilise technology in their teaching practice’. The justification why two aspects of this framework have been included will be discussed shortly in Chapter 2.8. First of all, a framework for TEL will be presented and applied in order to inform the rest of the chapter.

2.6 A Framework for TEL

This section expands on the previous discussion by critically analysing specific Web 2.0 technologies that are of particular relevance to learning in CUL as well as throughout wider UK HE. PowerPoint, Audience Response Systems and videos are all evaluated (see Figure 7 overleaf) due to being used frequently at CUL and throughout UK HE. TEL is separated into three areas by the HEA - ‘personalised learning’, ‘flexible socialisation’ and ‘flexible learning’ (Gordon 2014). As mentioned above, these three areas will be used to structure the rest of this chapter. In addition to VLEs and Mobile learning, Flipped learning and Online International Learning (OIL) were additionally included in the flexible learning category as these two initiatives are a major part of CUL’s teaching, learning and assessment strategy (Coventry University 2015) and both greatly influence the student experience and an academic’s work schedule. The flexible learning section focuses on pedagogical vehicles that use technology rather than specific learning technologies. Instructionist, Constructivist, Constructionist, Cognitivist, Socio-cultural and Collaborative learning strategies and their relationship to specific learning technologies are also discussed in this section. Learning technologies associated with personalised learning are analysed first in Figure 7:

Figure 7: Personalised learning



(Based on Gordon 2014).

2.6.1 Personalised learning

Personalised learning is defined by Gordon (2014: 1) as ‘a range of learning experiences and teaching strategies which aim to address the differing learning needs, interests and the diverse backgrounds of learners’.

Although it can be challenging to create an effective personalised learning environment if the desired outputs are not adequately scaffolded (McLoughlin and Lee 2010), there is persuasive evidence that suggests personalised learning is able to effectively contribute to the enhancement of the student learning process (McLoughlin and Lee 2010). If used appropriately, personalised learning is able to promote better student autonomy and engagement that is independent of physical and organisational boundaries. Personalised learning is particularly effective when students are able to provide input on how much information they want to share (Havergal 2015). Although there are advantages with personalising data as discussed above, the recent General Data Protection Regulation (GDPR) must be adhered to in order to protect the personal data of students (Cormack 2017). Therefore, although there is arguably the potential for both academics and universities to embed personalised learning into their pedagogical approaches in order to enhance student autonomy and engagement, care must be taken to ensure students’ personal data is not compromised.

The relationship between PowerPoint – arguably one of the most common technologies that can be personalised (Stephen 2007) and technology acceptance is evaluated below.

2.6.1.1 PowerPoint

Although viewed by some as rather old-fashioned, the usage of PowerPoint slides remains popular with a wide range of HE students (Farley et al. 2015). PowerPoint is commonly viewed as being able to have a positive effect on three main areas – cognitive recall, classroom interaction via Constructivism and classroom behaviours (James et al. 2006). In terms of cognitive recall, it has been discovered that the use of PowerPoint for lectures (and PowerPoint notes) has resulted in higher student grades. Furthermore, students who receive a lecture with PowerPoint (in comparison to those who do not) tend to achieve deeper levels of learning (Lowry 1999; Gabriel 2008). However, it is important to not only identify the effect of PowerPoint on progression rates but also on its capability to facilitate other learning processes, such as its potential to encourage meta-cognition (Kolb and Kolb 2005). On the other hand, it has been discovered that there are few connections between PowerPoint usage and student cognition (Amare 2006; Daniels 1999). Therefore, it is maintained that the results have been inconsistent in terms of cognitive recall.

PowerPoint has also been criticised for stifling classroom interaction due to its general purpose of imparting one-way didactic content and reducing the possibility of classroom discussions (Murphy 2002). Furthermore, Frey and Birnbaum (2002) discovered that PowerPoint actually acted as a negative influence in promoting positive classroom behaviours with 15 per cent of students surveyed stating that they were unlikely to attend a class in person if the PowerPoint slides had already been posted on the VLE. On the contrary, Szabo and Hastings (2000) unearthed the opposite finding with students indicating that they were more likely to attend a lecture if PowerPoint was utilised, particularly if printed handouts were available and notes from the lecture were able to be annotated. Despite these issues, the perceptions of students regarding the effects of PowerPoint have tended to be positive. For instance, Bartsch and Cobern (2003) discovered students perceived PowerPoint usage to be beneficial in increasing content recall and Atkins-Sayre et al. (1998) and Basturk (2008) found students perceived PowerPoint to be helpful in enhancing subject retention, their interest and understanding. PowerPoint has also been discovered to be useful in enhancing classroom interaction, particularly in supporting examination performance (Nowaczyk et al. 1998). As a caveat, irrelevant pictures and content can distract students rather than help them (Blokzijl and Naeff 2004; Voss 2004).

However, there is a dearth of current research regarding the effect of PowerPoint as a tool in facilitating technology acceptance from both a student and academic perspective and it is vital for educators to discover how to maximise the potential of PowerPoint due to its influence on student employability (James et al. 2006). Therefore, it can be summarised that there is arguably a mixed relationship between PowerPoint and technology acceptance from the research analysed above.

The next part of the personalised learning framework - Audience Response Systems – is now critiqued.

2.6.1.2 Audience Response Systems

As JISC (2017b) discusses, 48.4 per cent of UK HE students have never used Audience Response Systems (ARS) before attending university. This is an interesting finding as ARS are arguably capable of developing the quality of the classroom environment as their use can improve attendance levels, student focus, collaboration and engagement (Kay and LeSage, 2009). Arguably, ARS can enhance achievements in learning by fostering greater interaction and a higher quality of learning experience as well as improving the effectiveness of assessment through formative and normative feedback (Kay and LeSage 2009). Generally, students who participate in classes that use ARS do better than students who do not (Gauci et al. 2009). Licorish et al. (2018) similarly discovered the benefits for student learning and retention of Kahoot, an interactive ARS, in a study conducted in New Zealand. They found Kahoot was able to minimise distractions as it focused students on the lesson content and improved the atmosphere in the classroom. However, other research has demonstrated that there is no major statistical correlation with the use of ARS (clickers) and student engagement although it has been observed that more constructive discussions tend to take place when clickers are used (Johnson and Robson 2008). The perception of technology being supportive may be more successful than the actual effects of using any particular form (Johnson and Robson 2008). Nonetheless, performance in examinations can improve for students who use ARS seriously with there being a positive link with learners who have better attendance and classroom participation. Johnson and Robson (2008: 8) also discovered that clickers necessitate students to take greater responsibility for their studies and those who do not fully participate tend to perform poorly. However, it is stated that most research on ARS has taken place in the US and is usually focused on a specific curriculum subject (Heafner 2004).

In addition to the study above, it has also been discovered that clickers are useful in engaging students in large classes and are valuable in enhancing active learning (Patry 2009). To maximise the benefits of ARS usage in the classroom, it is contended that the technology must be tailored to learning objectives (Patry 2009).

Despite the benefits discussed above, there are a number of challenges regarding the effective usage of ARS from both the student and teacher perspective. For instance, as discussed earlier in the chapter, academics face challenges such as not having enough time to learn and set up ARS technology (Kay and LeSage 2009). Additional issues include the difficulty in creating appropriately challenging questions, being able to identify the most relevant questions to include and the ability to respond to student feedback in a timely manner. It should also be acknowledged that students can experience a number of issues when using ARS. These include adjusting to a new form of pedagogy, which may have not been practiced previously, confusion when multiple perspectives are employed and potential negative responses when monitored and evaluated on their performance by the lecturer (Kay and LeSage 2009). Indeed, ARS in large lectures are often difficult to organise and for students to participate in as certain learners are able to understand directions from the teacher more quickly than others (Gauci et al. 2009). This situation can result in delays with not every student participating meaning that the learning experience can be inconsistent. Moreover, students from different nationalities are often not used to responding instantaneously and may struggle to use ARS effectively, which in turn lessens the effect on Socio-cultural learning (Graham et al. 2007).

These results suggest that there is a mixed reception on the impact of ARS in facilitating technology acceptance in students, particularly when Socio-cultural learning is taken into consideration.

The next aspect of the personalised learning framework – the impact of videos (particularly YouTube) on technology acceptance is analysed below.

2.6.1.3 Videos (particularly YouTube)

There are a number of key ingredients that are required to improve student motivation (students, teacher, content, methods and environment) with the ability of the teacher to construct interactive lessons using technology such as YouTube a vital component (Williams and Williams 2011). YouTube particularly appeals to visual learners who enjoy watching interesting and thought-provoking content (Conole and

Alevizou 2010). YouTube has also been proven especially useful in facilitating resource-based learning where students are tasked to research a topic, record themselves then upload the video recording to YouTube to be viewed by the teacher and the class. This strategy has been viewed as engaging and popular with many students and generally effective by teachers due to it maintaining focus and encouraging discussion (DeWitt et al. 2013). However, it should be acknowledged that not every student may be comfortable being in a YouTube video due to privacy reasons. Nonetheless, this technique is generally useful in concentrating students on a task and encouraging greater collaborative input from the whole class (Conole and Alevizou 2010). Moreover, the use of YouTube is arguably a particularly effective pedagogical strategy as it integrates with other learning approaches (such as m-learning[13]) and creates a seamless experience for both students and lecturers (Wankel and Blessinger 2013). YouTube is also arguably supported by learning theory as its use is connected with building human relationships and global communities and does not solely focus on the exchange of information. As a result, YouTube may be able to enhance both social and affective learning (not only cognitive learning) and thus is able to encompass several complex student-learning strategies.

In addition, it has been discovered that YouTube videos are able to increase student engagement, raise critical awareness and increase deep learning of the subject matter (Clifton and Mann 2011). It appears that students find the accessible nature of videos contribute to these successes taking place. On the other hand, several issues regarding the integration of YouTube as a learning resource are noted. For example, some content can be unregulated, misleading, inaccurate and potentially biased. Nevertheless, it is asserted that YouTube can be particularly effective in engaging students in the lesson content, especially those who have become accustomed to using it in their social lives (Wankel and Blessinger 2013).

The final aspect of personalised learning – online simulations – is now analysed in relation to technology acceptance.

[13] Mobile learning.

2.6.1.4 Online simulations

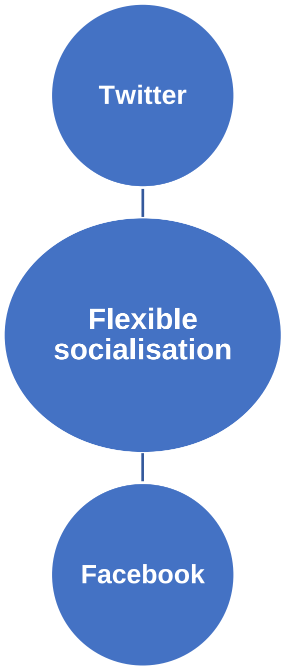
Online simulations are defined as a form of reality that enable students to practice situations in which they would not ordinarily have the opportunity to participate in (Lean et al. 2014). The perceived playfulness of participating in online simulations can play a prominent role in critically engaging students in a particular topic (Tao et al. 2009). Simulations have also been found to be effective in increasing the likelihood of meta-cognition taking place due to increased motivation, interpretive analysis and strategic thinking occurring (Margaryan et al. 2011).
Lean et al. (2006) researched in what ways academics use simulations to engage learners and studied what barriers existed when using them. They surveyed staff within one UK HE institution and discovered the usage of simulations was relatively widespread. However, a number of obstacles were reported regarding their use. These included that several academics were unconvinced about their benefits as a pedagogical tool with many teachers viewing simulations as too much of a risk. Arguably, the pedagogical benefits of simulations need to be promoted so that their implementation and usage becomes more widespread (Lean et al. 2006).
In addition, further barriers when adopting simulations as a viable tool to engage learners have been observed (Justice and Ritzhaupt 2015). Major challenges include a lack of financial resources to invest in the technology, a lack of time to plan and use the simulation and that it is not often possible to try out a simulation before buying it. Further obstacles include a lack of balance between educational benefits and entertainment, an inability to customise the simulation to match individual requirements and a lack of lesson plans on how to teach the simulation effectively. Academics have also found simulations to be complicated in aligning content to assessment methods and that it can be challenging to track student progress during the simulation (Justice and Ritzhaupt 2015).
However, it is affirmed that online simulations possess the potential to create a collaborative, constructive and stimulating learning environment which is able to increase student engagement, ownership of the material being studied, improve retention of information and increase the possibility of higher-level cognitive skills being developed (Damron and Mott 2005).

Flexible socialisation is now analysed, focusing on Facebook and Twitter.

2.7 Flexible socialisation - social media

Flexible socialisation in this regard focuses on social media and is articulated by Gordon (2014) as being useful in providing flexible, peer-to-peer interactions and supporting group activities. This section will start by analysing arguably the most popular and influential[14] social media platforms – namely Facebook and Twitter. These tools are commonly used at CUL and throughout UK HE as discussed by Times Higher Education (2017) and can be seen in Figure 8 below:

Figure 8: Flexible socialisation



(Based on Gordon 2014)

2.7.1 Facebook

A number of scholars have contended that Facebook is not only part of the ‘social glue’ that helps students to effectively settle into new environments, it is also a highly effective tool that can be used to engage students in the curriculum (Madge et al.

[14] Instagram was considered but not included due to being used in UK HE although not used at CUL. Instead, it was decided to concentrate on the two most popular platforms used at CUL: Facebook and Twitter.

2009: 141). On the other hand, although Facebook has the potential to be beneficial from an educational perspective for many students, university teachers are known to prohibit its use in class as they are unsure if it is being used purely for studying purposes (Roblyer et al. 2010). Moreover, many university staff tend to prefer to communicate by email meaning that several educators may find the use of Facebook to be redundant (Roblyer et al. 2010). Nonetheless, there are a number of uses to Facebook that are popular with students. These include students being able to create their own profiles, upload their own photographs, create blogs, join groups and exchange messages with other users (Kwong 2007). Indeed, DiVall and Kirwin (2012) advocate the creation of Facebook groups to facilitate class discussions on subject matter and assignment contents.

However, it is unclear if Facebook can be regarded as an effective communication tool in higher education due to the confusion on whether it is actually a social rather than an educational tool (Roblyer et al. 2010). This view is compounded by the fact that students appear to be more open to the idea of using Facebook as an instructional tool than teachers. Indeed, Irwin et al. (2012) in a study of Australian students discovered that the use of Facebook in class was supported by 76 per cent of students although only 51 per cent of them deemed it to be useful as an educational tool. This suggests that a number of students enjoy the non-studying benefits of Facebook (such as it acting as a “break” during class time).

Nevertheless, Facebook has been used by many scholars in formal academic settings such as sending course-related information to students and answering academic-related queries (Ivala and Gachago 2012).

If Facebook is actually able to increase student engagement, as many scholars suggest, it may be possible for it to be used in a positive pedagogical fashion in order to enhance student performance (Junco et al. 2012). Furthermore, if Facebook (particularly the use of Facebook groups) is accepted and endorsed by academics, there is a greater likelihood of it being accepted as a learning tool. This acceptance may lead to further student collaboration and Socio-cultural learning both on and off campus (Ivala and Gachago 2012).

The impact of Twitter as a tool in facilitating technology acceptance will now be discussed.

2.7.2 Twitter

Although Facebook is recognised by many academics as the most useful social media platform that is used to engage students, Twitter is nonetheless a valuable alternative tool that can be utilised (Junco et al. 2012). For instance, Junco et al. (2012) conducted an experiment using two study groups (Study Group 1 who were given a 1-hour demonstration on how to use Twitter in their subject and Study Group 2 who were told they may use Twitter if they desired).

Students in Study Group 1 were encouraged to use Twitter for continuity in class discussions, to ask questions to tutors and peers and discuss literature. Teachers also used Twitter to remind students about class times and campus events, to provide academic and pastoral support, to facilitate a positive 'cohort effect'[15], to engage students in discussions with each other, to organise study groups and to discuss the content of assignments.

Junco et al. (2012) discovered that students in Study Group 1 were much more engaged than those in Study Group 2. It was concluded that the use of instruction in Study Group 1 was more effective than not having any direction in the second study group, as no pedagogical justification was being offered in the latter case. Interestingly, the few students that willingly participated in the experiment in the second study group actually performed well in terms of achieving high grades. As a result, it was recommended that the study should be replicated with a larger cohort in order to discover if this finding is consistent with students who work independently and who do not engage with academic instruction.

Furthermore, Junco et al. (2011) utilised a controlled design strategy to understand the correlations between Twitter use and student engagement which was connected to Chickering and Gamson's (1987) seven principles for good academic practice in undergraduate education. These principles include:

- Student/faculty contact
- Co-operation among students
- Active learning

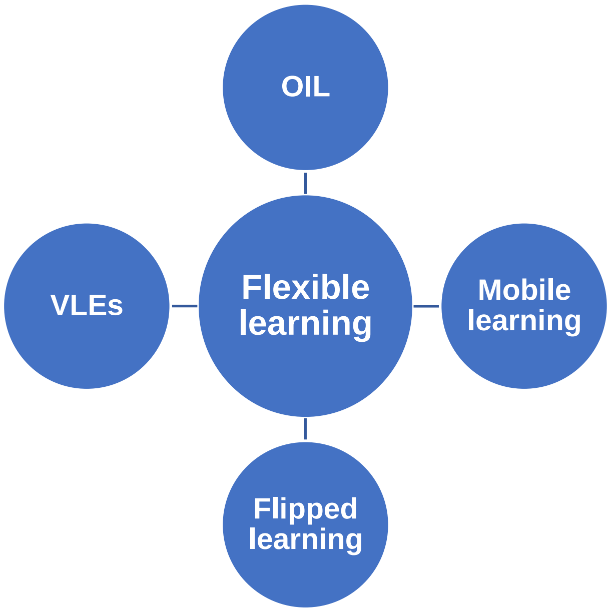
[15] The indirect effect of several members of a cohort on other members. This expression has positive connotations in the example above.

- Prompt feedback
- Emphasising time on task
- Communicating high expectations
- Respecting diversity

Junco et al. (2011) discovered that students who used Twitter had better levels of engagement as well as higher grades than those students who were in the control group and did not participate. Although this is a single study from a number of years ago, this experiment arguably demonstrates Twitter's potential capabilities in improving student engagement and ultimately grades.
Twitter has also been implemented in lectures in order to ascertain its impact on student engagement. It has been discovered that Twitter is generally successful in improving enjoyment and ultimately engagement in the subject being taught although there are still a number of students who do not perceive it to be a useful pedagogical tool, mainly due to the fact that they have not used it before (Welch and Bonnan-White 2012). Although it is acknowledged that there is little known about the relationship between Twitter and positively engaging students, it does appear to possess the potential to increase both technology acceptance and student engagement (Mirvis et al. 2006).

Two aspects of Barnett's (2014) 'Conditions of flexibility' framework – that was discussed earlier in the chapter - will now be employed to construct the next part of the literature review – pedagogical flexibility (the support of flexible teaching and learning processes) and learner flexibility (student choice within the learning experience). These aspects are combined as 'flexible learning' which is displayed in Figure 9 on page 76:

Figure 9: Flexible learning



(Based on Gordon 2014; Barnett 2014)

2.8 Flexible learning - Virtual Learning Environments (VLEs)

As mentioned above, two aspects of Barnett's (2014) 'Conditions of flexibility' framework are utilised to form 'flexible learning' – pedagogical flexibility (the support of flexible teaching and learning processes) and learner flexibility (student choice within the learning experience). The first part of this section will examine the effectiveness of VLEs in enhancing student motivation, engagement and ultimately technology acceptance. As discussed in 2.6, this section focuses on platforms that use technology rather than specific learning technologies. The usefulness of Moodle will be particularly critiqued (rather than Blackboard) as this platform is used frequently by the participants in this project. The benefits and disadvantages of incorporating Moodle as a learning technology, both outside and inside the classroom, are also analysed.

2.8.1 VLEs (particularly Moodle)

VLEs such as Moodle are often seen as the most useful form of technology due to students experiencing greater satisfaction. This is because they allow students the ability to manage their schedules and keep up-to-date with university news and information about their course (Henderson et al. 2015). Indeed, JISC (2017b: 1) in a survey on digital engagement discovered ‘HE learners are highly likely to use VLEs: 80% rely on it to do coursework and 67% regularly access it via a mobile device’.

As Bower and Wittmann (2011: 63) state, Moodle is a ‘platform with which educators can design and deliver online learning experiences, and thus offers another possibility for developing education students’ technology-based learning design skills’. Moodle has been found to possess a number of advantages in engaging students. These include allowing participation in a range of activities, the fact that it is available at anytime and anywhere, it provides an effective teaching framework and it allows collaborative and interactive learning to take place (Novo-Corti et al. 2013). Moodle has also been found to have benefits in providing an organised and integrated framework that enables students to better understand lesson content (Novo-Corti et al. 2013). Furthermore, the email function in Moodle can be regarded as a useful tool in developing a learning community where students are able to interact with each other and ask their teacher for clarification and advice when necessary (Deng and Tavares 2013). Moodle can also be useful in increasing self-directed learning as it can change student behaviours from knowledge receptors and seekers to knowledge constructors (Steffens 2008: 222). On the other hand, a number of limitations can be identified when using Moodle with technical difficulties highlighted as one of the major issues it can sometimes encounter (Steffens 2008: 222). It has also been discovered that Moodle can cause information overload in students and several functions on the Moodle platform are viewed as limited (Bower and Wittmann 2011).
As can be seen above, there are various disagreements regarding the effectiveness of VLEs such as Moodle in engaging students and contributing to better performance. Chowdhry et al. (2014) believe these different perspectives might be influenced by several factors. For example, the results may be affected by whether this was the learner’s first experience with the VLE, whether the usage of VLEs was an accepted and common practice at a particular institution, or whether students had previous experience of studying in an online environment and had sufficient IT literacy to successfully navigate the system. In addition, the capability of the individual academic in effectively organising the VLE must be recognised as well as

what form of learning activities and materials are embedded into the system. Chowdhry et al. (2014) proffer that these issues are particularly salient, as the PEOU of any VLE will have a significant impact on whether it is effectively embraced. Moreover, it is asserted that students taking part in a computer science module who possess both the knowledge and experience of how an online learning environment operates, may be more comfortable and enthusiastic in using VLEs than students on other courses without the requisite IT knowledge and experience (Chowdhry et al. 2014). The latter group of students may be more accustomed to a more Instructionist, face-to-face way of learning. Furthermore, it is affirmed that all VLEs need to be well-designed and possess a wide variety of learning activities and materials in order to be as appealing as possible for all students (Chowdhry et al. 2014). In many ways it appears that the actual number of visits to a VLE and the duration spent completing activities are not the most important factor in generating student success (Chowdhry et al. 2014). Instead, the structure of the module and how it is linked to the VLE are seen as more influential. Moreover, the composition of the VLE is extremely important with it necessary to include activities that encourage student engagement and interaction. As a result, it is vital for teachers to deliver a creative pedagogical strategy that encompasses innovation and technology-enabled learning activities when using a VLE (Chowdhry et al. 2014).

Therefore, it is contended that those who develop and add content to the VLE (such as learning technologists and academics) play a vital role in engaging students. As Mijatovic et al. (2013) state, it is important for the content of any VLE to adopt a deep learning strategy. However, there is arguably a gap between student expectations of what a VLE should contain and offer and the capability of tutors who are expected to fulfil these expectations (Gray and Smyth 2012; JISC 2017c). Thus, it is recommended that institutions must attempt to improve the IT literacy of its employees by conducting specific training programmes in order to enhance the skills of the deliverers and ultimately the learning experience for students who use VLEs (Porter et al. 2014; JISC 2017c). However, it should also be mentioned that students do not always have specific expectations about how they will learn and what technologies they will use. For instance, Margaryan et al. (2011) discovered that students tend to form expectations based upon their previous learning experiences and not from the technology they use outside of class. It is also maintained that students do not necessarily need a greater quantity of learning technologies embedded into their curricula, rather more focus on quality and the relevance of the technologies that they use (JISC 2017c).

Overall, Moodle is viewed as a convenient tool that is generally perceived in positive terms by both students and academics although the stability of the VLE in conjunction with the level of student interface interaction are viewed as key components in creating suitable levels of participant satisfaction (Chowdhry et al. 2014).

Online discussion forums, one of Moodle's main functions, will now be discussed below.

2.8.2 Online Discussion Forums

Balaji and Chakrabarti (2010: 1) contend that online discussion forums are a popular platform in which to facilitate communication between peers and tutors with the capability to receive rapid feedback and interact with others amongst its most useful aspects:

> *'The use of the online discussion forum (ODF) has emerged as a common tool and an effective way of engaging students outside the classroom. ODF is an e-learning platform that allows students to post messages to the discussion threads, interact and receive feedback from other students and instructor, and foster deeper understanding towards the subject under study. In an ODF there is no loss of data as the students' written messages are stored in the virtual space, and can be retrieved and reviewed anytime'.*

The usage of online discussion forums is viewed as helpful in providing students with a more conducive environment to communicate, particularly for those individuals who prefer to avoid face-to-face confrontation and are more comfortable addressing issues online (Karacapilidis and Papadias 2001). Deng and Tavares (2013) concur when stating Moodle discussion forums are more likely to provoke lively and more spirited debate than in a face-to-face situation.

Online discussion forums are seen to be less prone to domination by individuals as in a face-to-face environment and possess the capacity for greater freedom in which opinions can be expressed openly (Redmon and Burger 2004). Participants can have greater flexibility when compared to communicating in real time as they have the opportunity to reflect on previous discussions and formulate meaningful replies (Anderson and Kanuka 1997; Seale and Cann 2000). Students are also able to contribute when they feel most comfortable and capable in creating an interesting and meaningful discussion (Deng and Tavares 2013). Arguably, this element is able to improve the intellectual experience as well as student engagement (Anderson and Kanuka 1997). Pedagogical benefits can also develop from this scenario where reflective capabilities can be constructed (Deng and Tavares 2013). For example, Lee (2013) conducted a study on an ecology course regarding the relationship between student perceptions of online discussions, their approaches to learning and the resultant academic performance. The results demonstrated that learners who had a deep reflective approach to learning had the highest level of engagement and the best results. Romero et al. (2013) similarly discovered that those students who engaged more with the discussion forum performed better than those who did not. It does appear that students who willingly participate on online discussion forums and read and digest specific contents have a better performance in examinations than those who are less engaged (Cheng et al. 2011).

On the other hand, Demian and Morrice (2012), found there was a limited correlation between the academic performance of students and the length of time they engaged with an online forum.

Another key component of Moodle; Moodle quizzes, will now be evaluated below:

2.8.3 Moodle quizzes

Like ARS discussed above, Moodle quizzes possess a number of advantages in engaging students in the lesson content. For instance, they are particularly beneficial in increasing interaction levels and in providing detailed, rich and immediate feedback to students (Butcher et al. 2013). Moodle quizzes also provide value for teachers who are able to disseminate feedback and subsequently prepare suitable activities that are able to address specific student weaknesses (Butcher et al. 2013).

Blanco and Ginovart (2012) used Moodle quizzes to test mathematics students. They discovered that:

> *'Moodle quizzes could be regarded as a suitable tool to inform students of their performance throughout the learning process'.*

In addition, Blanco and Ginovart (2012) noted that Moodle quizzes were an effective tool to check the contents of a chapter as a review mechanism. This strategy in turn led to greater student self-regulation and more application to their studies throughout the academic year. As a result, Moodle quizzes can arguably be articulated as an effective pedagogical strategy in encouraging a fun, competitive and interactive atmosphere between students and as an effective alternative to regular forms of continuous and formative assessment (Blanco and Ginovart, 2012).

2.8.4 Blackboard

Liaw (2008) discovered that the perceived self-effectiveness of students and PU of Blackboard was vital in facilitating acceptance as a viable educational tool. Liaw (2008) separates the attitudes of participants into three different levels: individual experience and quality of the system level (how individual characteristics and the quality of the system can change cognitively and affectively). The second level regards cognitive and affective components (how these components can alter behavioural intention). The final level concerns behavioural intention (how behaviour is connected to technology usage).

It can be concluded from this research that it is vital for students to understand the pedagogical benefits of participating with the Blackboard VLE. Once this is established, the perceived self-effectiveness of learners is viewed as key in order for the technology to be accepted, participation to occur and ultimately for learning to take place.

Mobile learning, arguably one of the most controversial areas of flexible learning will now be discussed in the next section.

2.9 Flexible Learning - Mobile Learning

It is asserted that mobile phones possess both advantages and disadvantages for teachers. For instance, students are now able to effectively search for a wide variety of information in a matter of seconds although the addictive nature of mobile phones can prove to be problematic (Kuznekoff and Titsworth 2013). Teachers are often in competition with these devices for the attention of their students who may easily be distracted by texting or accessing irrelevant material such as participating in social media activities when a class is taking place (Kuznekoff and Titsworth 2013).

However, the pedagogical benefits of using mobile technologies appears yet to be fully optimised. As Herrington et al. (2009: 2) state:

> *‘Despite the significant potential of mobile technologies to be employed as powerful learning tools in higher education, their current use appears to be predominantly within a didactic, teacher-centred paradigm, rather than a more constructivist environment. It can be argued that the current use of mobile devices in higher education (essentially content delivery) is pedagogically conservative and regressive. Their adoption is following a typical pattern where educators revert to old pedagogies as they come to terms with the capabilities of new technologies’.*

This situation is eloquently described by Mioduser et al. (1999: 758) as ‘one step forward for the technology, two steps back for the pedagogy’.

Nonetheless, due to the popularity and expansion of mobile devices, it is vital that HEIs have a coherent and integrated strategy that maximises the benefits of their usage in the classroom (Gikas and Grant 2013). For example, Kuznekoff and Titsworth (2013) in a study of a class using mobile phones during a lecture, discovered that there were a number of issues associated with students who used their devices. For instance, students who did not use mobile phones during the lecture wrote down 62 per cent more information than those who did. Furthermore, the students who did not use mobile phones made notes that were more detailed, they could remember a greater amount of information after the lecture and scored 1.5 times higher than students who used their devices during class time. This study concluded that although there are several pedagogical benefits to be had when using mobile phones, there are also a number of associated distractions that can reduce student concentration, engagement and ultimately performance.

Mayer (1996) utilised information-processing theory when researching the positive and negative effects of texting on student performance. As Mayer (1996) discusses, information processing theory analyses the attention span, memory capacity (working, short-term and long-term) and meta-cognitive ability of individuals when they process new information. Using this theory, Mayer (1996) found texting was a major contributor in reducing student learning. For example, students who texted during lesson time were distracted from the task in hand leading to reduced working memory and short-term memory. This situation then led to inaccurate and insufficient memory storage, which also affected the quality of long-term memory. Kuznekoff and Titsworth (2013) add covert (such as texting in secret) or overt (for instance answering the phone) usage were commonly viewed in negative terms by both fellow students and teachers.

In addition, Kraushaar and Novak (2010) conducted a test on the correlation between laptop usage and student attainment. With the agreement of participants, they fitted laptops with a device to ascertain if legitimate software (defined as Word, PowerPoint and Excel) was used in class. Distractive elements were defined as searching the internet for entertainment purposes, reading email and instant messaging. The research uncovered that 62 per cent of the programmes used by students were in the distractive category. It was also discovered that instant messaging had the most damaging effect on student performance with grades on quizzes, projects and the final examination all negatively impacted.

Indeed, students who participate in multi-tasking activities in class (such as texting, emailing and posting on Facebook) as well as listening to lectures, tend to suffer in terms of exam performance (Wood et al. 2012). In addition, Wei et al. (2012) found students who text in class are unable to self-regulate their behaviour and tend to perform more poorly in assessments. They recommend teachers need to explain explicitly to students the reasons why texting and posting to social media websites should be avoided in class as well as the potential ramifications for doing so.

However, students who perceive mobile phones to be beneficial to their academic success are able to create greater levels of engagement, collaboration and learning in the classroom (Gikas and Grant 2013). It has been discovered that mobile phones are seen by students as essential learning tools due to their ability to access large quantities of relevant information instantaneously, they are portable and enable learners to personalise their own content (Traxler 2010). Indeed, Valk et al. (2010) claim that mobile phones can actually promote new forms of learning and enhance educational outcomes. They add that mobile learning is able to personalise the learning process as students can customise the transfer of information in order to meet their individual educational goals. Scornavacca et al. (2009) similarly contend the use of mobile phones in the classroom is beneficial in promoting active learning, offering greater understanding to lecturers on student performance as well as enhancing student motivation and creating a learning community. Mobile phones can offer students greater freedom to express themselves without the need to be constantly supervised by a teacher (Hartnell-Young and Heym 2008; Sung et al. 2015) with discipline-specific Apps useful in focusing students on the lesson content (Farley et al. 2015).

Arguably, it is essential for mobile learning strategies in the classroom to be grounded in instructional design. It is vital for educators to understand how mobile phones add to the learning context before utilising them in the classroom. Academics need to determine if an activity can maximise the qualities of mobile phone usage (Dennen and Hao 2014) in order to enhance student performance and progression. Productivity, flexible access, capturing and integrating relevant data and acting as a tool that promotes collaboration and communication are all desirable outcomes from mobile phone usage (Gay et al. 2002). As Dennen and Hao (2014) discuss, the term ‘outcomes’ can be explained as what actually happens in a class as a result of implementing mobile learning as a pedagogical strategy.

However, it is contended that mobile phones should only be used if they complement the learning setting (Reighluth 1999) as technology’s role in any learning environment is more sophisticated than merely deciding to use it if there is internet access (Dillenbourg and Jermann 2010). It is important for educators to effectively consider conditions such as time, space and whether the activities employed will be more teacher than student-centric. Further issues include how prepared the students are, the capability of individual students in using the technology as well as attitudes to its use. As Terras and Ramsay (2012) discuss, these issues can have an effect on student expectations and resultant motivation to participate. Moreover, students who have not had the experience of using mobile phones may be at a disadvantage when compared to others who have (Dennen and Hao 2014). Sharples (2013) believes mobile learning can take place in a variety of different conditions and activities should be designed with the learning context wholly in mind. For instance, Wi-Fi stability, insufficient lighting and noise may act as distractions. Moreover, learning may be asynchronous or synchronous and occur over different time periods (Sharples 2013). Dennen and Hao (2014) elucidate that further disruptions to mobile learning may occur due to incoming alerts, text messages and phone calls.

There has been a debate between academics who are unable to agree on whether the use of mobile phones tend to support lower order skills (Gikas and Grant 2013) or if they can effectively improve higher order skills (Hwang and Chang 2011) and correlate to Bloom's taxonomy (Bloom et al. 1956). It is also asserted that academics need to consider unintended negative outcomes, which may result from a mobile learning exercise (Dennen and Hao 2014). These issues may include, for example, online cyber bullying and cyber loafing. Ahn et al. (2011) suggest that educators may be able to restrict these problems by creating a single account where they have full control of administering the activity and subsequent content.

Overall, it is maintained that mobile learning possesses particular pedagogical benefits in that it can be more creative, constructive, collaborative and affords the ability to share a greater amount of information more efficiently than other platforms (Dennen and Hao 2014). Mobile learning arguably possesses the potential to be more transformative than other forms of (especially traditional) learning. Nonetheless, it is essential for all educators that use mobile learning to understand the learning theories discussed earlier in the chapter in order to deliver the best possible learning outcomes to their students as articulated by Dennen and Hao (2014).

Educators need to adopt a robust stance and make clear and rational judgements in order to avoid ethical issues. For example, complexities include ownership of archived conversations and the over-use of mobile phones (Dennen and Hao 2014). As Sharples (2013) affirms, extended usage of mobile phones in the classroom can lead to intrusions in one's home life. There are two further ethical issues to be considered – device ownership and digital footprints[16]. This is because some students may feel uncomfortable or embarrassed if their device is older or has fewer functions than other classmates' phones. This scenario may result in a reluctance to participate in collaborative activities (Sharples 2013). Furthermore, many online learning accounts require students to register. These accounts generate data and digital footprints which many learners may feel uncomfortable about. Again, this issue may limit student involvement in mobile learning activities with many individuals concerned about cybercrime and the issues surrounding big data security (such as GDPR legislation).

The next section of flexible learning will focus on two major pedagogical strategies implemented in CUL – Online International Learning (OIL) and flipped learning.

2.10 Flexible Learning - Online International Learning (OIL)

Online International Learning (OIL) is an innovative teaching paradigm that facilitates intercultural competences via meaningful online discussions between higher education practitioners and students in distant locations (de Wit 2013). OIL has been elucidated as a collaborative form of pedagogy that enhances collaborative and socio-cultural learning as well as the student experience (de Wit 2013).
As Piggott (2012) asserts, higher education students revel in experiencing real situations that can often bring what is taught in the classroom "to life".
OIL has been discovered to be valuable in facilitating better interaction between peers, collaboration between different nationalities and increasing the autonomy of learners. Indeed, Davies and Myréen (2015: 1) state:

> *'For the effective development of cultural competence and communication skills students need more learning tasks in the real world in collaboration*

[16] A data trail created while using the Internet.

> *with foreign students. Web 2.0 tools enable students in different parts of the world to communicate and thus increase each other's cultural competence'.*

Villar-Onrubia and Rajpal (2015) studied the impact of OIL on the student experience in a study at Coventry University, using the term 'virtual mobility' to describe its function and effects. They discovered that OIL was able to add a greater amount of flexibility to the student experience as learners were able to share productive discussions and debates with their counterparts in other countries without having to leave the classroom. Villar-Onrubia and Rajpal (2015) found OIL was able to significantly contribute in improving digital literacy and Socio-cultural learning in students.

Despite the many benefits that can be associated with OIL projects there are also a number of inherent weaknesses. The first issue regards potential technological issues where some students may not have the requisite IT skills to fully participate in an OIL project. Secondly, technological problems in the form of unreliable internet connections may disrupt or even prevent an OIL session from taking place. Moreover, Villar-Onrubia and Rajpal (2015) state that as OIL projects are conducted in English, there may be language issues for those that participate who are not native speakers. A final criticism regards the fact that some students may not understand the benefits of engaging in an OIL project, meaning that there could be a lack of enthusiasm and participation in activities. Arguably, one way to prevent this situation from occurring is to add a form of assessment to the project in order to stimulate interest and increase overall participation.

Thus, Taylor (2017) created an integrated OIL project and field trip in order to develop student understanding before they undertook an examination at CUL. Students were able to interview the author of a case study on the subject matter via Skype before an examination and then subsequently visit the partner university to discuss the issues raised in more depth. The results of the initiative were positive and confirmed the literature that elucidates OIL as a creative teaching strategy that is able to facilitate Collaborative and Socio-cultural learning, improve student experience and 'virtual mobility'. The performance of the students was higher when compared to the previous cohort (there was an improvement of 11.5% in the pass rate with every student passing) and student satisfaction rose to 100 per cent from 89 per cent. Although there have been few studies on the effectiveness of OIL in facilitating student learning gains, arguably this initial research has demonstrated several promising findings.

The final aspect of the flexible learning framework – flipped learning will now be critically evaluated.

2.11 Flexible Learning – Flipped Learning

There have been a number of definitions of flipped learning[17] with most concurring that it provides students with greater flexibility in their learning as they are able to complete their studies in their own time and in their own preferred locations. For example, Hamdan et al. (2013: 4) comment:

> *'In the Flipped Learning model, teachers shift direct learning out of the large group learning space and move it into the individual learning space, with the help of one of several technologies'.*

Furthermore Knewton (2013 no page) states:

> *'The flipped classroom inverts traditional teaching methods, delivering instruction online outside of class and moving "homework" into the classroom'.*

On the other hand, it can be argued that the flipped classroom has no universal definition because educators tend to use their own unique strategies when engaging students (Stumpenhorst 2012).

[17] Also referred to by a number of scholars as 'the flipped classroom'.

Figure 10 below illustrates how the flipped classroom works in practice:

Figure 10: The Flipped Classroom

Source: Knewton (2013)

As can be seen above, instructors are no longer “a sage on the stage” with greater emphasis placed on teachers to be “a guide on the side” meaning that they are less visible in the classroom and are now seen more as facilitators in the student learning process.

In a qualitative case study of 28 undergraduate students at CUL, Taylor (2015) unearthed a number of advantages and disadvantages when using the flipped classroom approach as a vehicle to engage and motivate both learners and academics.

In terms of positives, there were tangible advantages with flipped learning offering academics greater flexibility on how they can teach their lessons with seminars able to become more interactive and targeted on addressing specific student weaknesses. This potential increased level of engagement can be stated as one of its greatest strengths (Taylor 2015). It was discovered that students who engaged were able to benefit the most from flipped learning. This is because they were able to study when and where they liked and review material when necessary: something which is not possible in a traditional classroom setting (Taylor 2015).

In terms of technology acceptance, whereas some students enjoyed the freedom of working when they wanted to and performed better in seminars, others did not take it particularly seriously and were not as engaged as expected (Taylor 2015). It was hoped that the interactive quizzes and videos would be the most engaging aspect although this was only true with some students (Taylor 2015). The lack of preparation for seminars was another disappointing outcome with several learners appearing not to have studied the flipped class at all, making it impossible to utilise the higher evaluative echelons of Bloom's taxonomy[18] as in Figure 11 below (Bloom et al. 1956) and ascertain if subject-level cognition had been enhanced.

Figure 11: Bloom's taxonomy

Higher order thinking skills

Some materials have been removed from this thesis due to Third Party Copyright. Pages where material has been removed are clearly marked in the electronic version. The unabridged version of the thesis can be viewed at the Lanchester Library, Coventry University.

Source: Based on Bloom et al. (1956)

The issue of not being able to monitor if students had done their work was the most frustrating aspect of the whole study. There was also no discernible benefit to Socio-cultural learning with the Chinese students (the largest group) demonstrating the overall lowest forms of engagement. There were mixed learning gains with the other nationalities.

In terms of negatives, it was discovered that teachers needed to be competent with technology to develop, implement and administer flipped learning. Furthermore, the time taken to create the flipped classes was extensive and there was no way of

[18] Bloom's taxonomy is a hierarchical model that is used to classify educational learning objectives into levels of complexity and specificity. These areas are focused on cognitive, affective and sensory aspects.

understanding whether a student had completed a flipped activity or not. There were also various weaknesses with the flipped classroom from the student perspective. For instance, many students actually preferred face-to-face lessons where they could question teachers in order to clarify their understanding; a situation that is not possible in flipped classes. Furthermore, certain students preferred the traditional classroom environment and were not overly comfortable using technology in their studies. Some learners also favoured interaction with other students rather than with a computer (Taylor 2015). Therefore, the influence of flipped learning in facilitating technology acceptance in academics and students at CUL was discovered to be mixed at best.

2.12 Chapter Two summary

Chapter Two has provided a definition of learning technologies and has stated that institutions such as CUL do not appear to have a clear understanding of how learning technologies positively influence technology acceptance. Key learning theories have been discussed focusing on Instructionism, Constructionism, Socio-cultural learning, Collaborative learning, Cognitivism and Constructivism with the latter theory contended as particularly relevant for this thesis. Factors influencing technology adoption in students and academics were analysed and a discussion on university investment into learning technologies was provided. The effectiveness of common tools used by both students and academics at CUL and in UK HE were critiqued as well as their impact in facilitating technology acceptance.

Chapter Three will now examine and analyse the theoretical frameworks that are used in the study, focusing on TAM as the most relevant and useful theory to be applied in the thesis.

Chapter Three - Literature Review Part 2 – Theoretical frameworks

Chapter 1 – Introduction	Chapter 2 - Literature Review 1	**Chapter 3 - Literature Review 2**	Chapter 4 - Research Design	Chapter 5 - Student Findings	Chapter 6 - Academic Findings	Chapter 7 – Discussion	Chapter 8 – Conclusion

3.0 Introduction to Chapter Three

Chapter Three follows a lineal, chronological structure; beginning with a discussion on the evolvement of technology acceptance from the past to the present day with the focus on the Technology Acceptance Model (TAM) and associated contemporary extensions. Adhering to this structure is affirmed as useful in demonstrating how technology has evolved and why TAM is ultimately the most suitable framework to be used in this thesis. First of all, Innovation Diffusion Theory (Rogers 1962) is discussed followed by Social Cognitive Theory (Bandura 1977). Then, the Theory of Reasoned Action (Fishbein and Ajzen 1980) and the Theory of Planned Behaviour (Ajzen 1991) are critically analysed. After that, the most important model applied in the research; TAM is critiqued (Davis et al. 1989). Extensions of TAM; TAM 2 (Venkatesh and Davis 2000), TAM 3 (Venkatesh and Bala 2008) and 3-TUM (Liaw 2008) are also analysed. Then, the Unified Theory of Acceptance and Use of Technology - UTAUT 1 (Venkatesh et al. 2011) and UTAUT 2 (Venkatesh et al. 2012) are discussed and evaluated followed by a critical examination of the Hedonic Motivation System Adoption Model (Lowry et al. 2013). The Technology, Pedagogy, and Content Knowledge Model (Mishra and Koehler 2006) is then analysed. The chapter continues with an investigation surrounding teacher effectiveness with technology, teachers' beliefs about technology and learning and external variables affecting academic acceptance of learning technologies. These particular theories have been selected for two reasons – that they represent a lineal progression of the evolvement of learning technologies as well as their relevance to TAM. The extensions of TAM are arguably especially appropriate and useful as they are contemporary theories of technology acceptance. Moreover, as will be discussed in Chapter Seven, aspects from several of these theories have been included in the finalised conceptual framework after establishing theoretical saturation via the CGT process.

The chapter concludes with a justification for the use and application of TAM in the thesis and how specific elements of other theories and frameworks have been used to create the conceptual framework presented in Chapter Seven.

Innovation Diffusion Theory is evaluated first below:

3.1 Innovation Diffusion Theory

Innovation Diffusion Theory (IDT) is arguably the first recognised theory that focuses on technology adoption. This theory was created by Rogers (1962) in order to understand how technology is adopted or rejected as well as the rate to which adoption or rejection takes place. In terms of a definition, ‘innovation’ is articulated as an idea or practice which is new to a social system or individual with ‘diffusion’ described as ‘the process in which an innovation is communicated through certain channels over time among the members of a social system’ (Rogers 2003: 5).

Rogers (2003) believes that there are four main factors that comprise innovation diffusion; innovation, communication channel(s), time and social systems. IDT has been viewed by a number of scholars as a valid theory to be used in the adoption of technology and is particularly relevant in an education environment (Medlin 2001) such as in this study. In terms of weaknesses, IDT has been criticised due to its assumption that technology is static and unmoveable and that it tends to be used by homogenous societies (Lyytinen and Damsgraad 2001; Sahin 2006). This thesis supports both of these criticisms due to technology constantly evolving and being available to a wide number of populations; such as the international students involved in this thesis.

Social Cognitive Theory is now discussed due to its connection with pedagogy.

3.2 Social Cognitive Theory

Chen and Huang (2013: 90) articulate Social Cognitive Theory (SCT) ‘describes an individual’s behaviour in terms of a reciprocal feedback system involving environment, personal attributes and behaviours’. SCT has been popularly used in studies on pedagogy, management and computing (Chen and Huang 2013). This theory articulates that individuals (such as students and academics) are able to learn by observing the actions of others. Arguably, learning is most likely to occur if the individual concerned has a high degree of self-efficacy, in that they have belief in their ability to solve specific issues (Bandura 1977). For instance, in connection to this thesis, students who are more confident using technology would be more likely to accept and use it to solve a particular problem (for example when using PowerPoint to deliver a presentation to a large audience).
However, learning is regarded as an internal process that may or may not lead to positive behaviour or immediate learning. SCT elaborates that learners set goals and regulate their own behaviour. Social-cognitive theorists also believe that punishment and reinforcement have indirect effects on learning and subsequent behaviour (Bandura 1977).

In contrast, the Theory of Reasoned Action below (TRA) predicts that behavioural intent is caused by two elements; an individual’s attitude and their subjective norms.

3.3 Theory of Reasoned Action

Arguably, Ajzen and Fishbein’s (1980) Theory of Reasoned Action (TRA) can also be regarded as one of the foremost models to be developed in technology acceptance research (Trafimow 2009). TRA was created and based upon both diffusion and adoption theories (Ajzen and Fishbein 1980). This theory explains that the decisions users make are based upon their attitudes and societal norms with their attitudes inherently linked to individual beliefs and values. Values can be regarded as the deepest form of culture and are often unconscious to individuals (Hofstede 2001). Individual norms are connected to the motivation to act in specific situations and act in a particular way in respect to accepted cultural norms (Hofstede 2001). TRA suggests that external variables (such as those that form part of the

Technology Acceptance Model) directly influence attitudes, subject norms as well as their relative weight/importance (Legris et al. 2003).

However, although TRA (see Figure 12 below) has been popularly used in psychological research, it is arguably limited in that it assumes behaviour is under volitional control. Furthermore, as TRA has been based upon societal norms it is arguably problematic to understand individual technology acceptance as this may not be possible to observe due to learning taking place within different societal contexts.

Figure 12: Theory of Reasoned Action

Source: Legris et al. (2003)

Consequently, the Theory of Planned Behaviour was developed from the Theory of Reasoned Action to address its limitations and helps us to understand how human behaviour can be modified (Ajzen 1991).

3.4 Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB: see Figure 13) proposes that human action is influenced by three main areas: behavioural beliefs (what beliefs are likely to occur because of the behaviour), normative beliefs (beliefs regarding others' normative expectations) and control beliefs (beliefs about issues which may improve or negatively affect behavioural performance). These three aspects are integral in situations when changing the behaviour of individuals (Ajzen 1991). Behavioural beliefs create positive or negative attitudes towards a behaviour, normative beliefs produce perceived social pressures or a subjective norm, and control beliefs create the perception of behavioural control (Ajzen 1991). The attitude towards a particular behaviour and subjective norm as well as the perception of the behavioural control result in the creation of a behavioural intention (Ajzen 1991).

Teo and Beng Lee (2010) used TPB to ascertain what specifically influenced technology adoption in teachers. In a study of 157 teachers using survey questionnaires, they discovered that attitude towards usage and subjective norms was correlated with intention to use although behavioural control was not viewed as a significant influencer.

In summary, the more positive the attitude and subjective norm and the more powerful the perceived control, an individual will generally have a stronger intention to follow or perform a particular behaviour. In relation to the subject under investigation in this thesis, if an individual user possessed a positive attitude regarding the use of technology and feels obligated to engage with it and has confidence in its usefulness in achieving a particular objective, the more likely they would be to accept and ultimately use it.

TPB is different from TRA as it includes a third independent determinant of user intention named ‘perceived behavioural control’ (illustrated as ‘Control’ in Figure 13 below). This element was introduced to deal with situations in which users have limited control or resources for carrying out a particular behaviour.

Figure 13: The Theory of Planned Behaviour

Source: Ajzen (1991)

Arguably, TPB can be criticised due to it being based on the assumption that behaviour can be completely controlled by individuals (Ajzen and Fishbein 2004). Furthermore, although a number of meta-studies have successfully demonstrated a reasonable amount of variance regarding intention to use and the final actual behavioural intention to use, the amount of variance for both of these elements could still be greatly improved (Baker et al. 2010).

The Technology Acceptance Model (TAM) was subsequently adapted from TPB in order to understand in more detail how individual users accept and use a particular form of technology. As this is the main theory used in the study, the subsequent sections will be discussed and critiqued in significant detail.

3.5 The Technology Acceptance Model

The Technology Acceptance Model (TAM) is an information systems model that has been designed to understand how users accept and use a particular technology (Davis et al. 1989). As can be seen in Figure 14 underneath, TAM can be used to ascertain decision making when users are presented with a new form of technology. TAM includes several factors that influence how frequently and in what way individuals accept and use technology:

Figure 14: The Technology Acceptance Model

Source: Davis et al. (1989)

As can be seen above, TAM is based on TRA as it suggests beliefs (PU and PEOU) influence attitudes, which ultimately leads to behavioural change. Furthermore, TAM adopts a similar structure as TRA in that it states technology acceptance is based upon two major constructs: PU and PEOU.

TAM illustrates that PU and PEOU are particularly influential when making the decision to use a particular technology. Davis et al. (1989) defines PU as the extent to which an individual user believes using a technology will improve their job performance. PEOU is explained by Davis et al. (1989) as the extent to which the use of a particular technology is viewed as straightforward and free from effort. These areas subsequently determine individual attitudes, behaviour and actual system use.

3.5.1 Perceived Ease of Use

PEOU is viewed by Davis et al. (1989) as being the first and most influential construct in technology acceptance. Venkatesh and Davis (2000) discovered that there are two connections related to behavioural intention to use technology: firstly, how easy a technology is perceived to use, followed by a mediating effect on PU. Venkatesh (2000: 345) postulates that there are three areas that influence PEOU: ‘anchors’, ‘adjustments’ and ‘experience’. ‘Anchors’ are described as one’s general thinking about a particular technology. ‘Anchors’ is separated into four further areas. The first area is related to self-efficacy and is focused on a user’s perceived ability to use technology successfully. The second aspect is articulated as the perceived amount of external control a user believes he/she has. Computer anxiety completes the third area with the perceived amount of playfulness fulfilling the fourth aspect (Venkatesh 2000).

‘Adjustments’ is elucidated as the current beliefs a user has regarding a particular technology. ‘Adjustments’ is divided into two areas – ‘perceived enjoyment’ and ‘objective usability’. These adjustments are based upon individual users’ past experiences with technology (Venkatesh 2000).

‘Experience’ is described as the length of time using a technology, which may be positive or negative. Experience is associated with both the complexity of the technology as well as to what extent the user received a suitable introduction on how to use it (Venkatesh 2000).

3.5.2 Perceived Usefulness (PU)

This construct is described as the degree to which an individual using a particular technology believes it will help his/her job performance (Davis et al. 1989). Although PU does not elaborate on the specific task at hand, this element is associated with extrinsic motivators such as financial incentives (Davis et al. 1989). For instance, if a technology is not perceived to be useful in accomplishing this aim, there is little likelihood that it will be accepted (Davis et al. 1989).

As mentioned above, PU is often influenced by PEOU with the former construct generally not considered if a particular technology is perceived to be overly complex.

3.5.3 Behavioural intention to use

Behavioural intention to use is an integral part of the Technology Acceptance Model and is dependent upon PEOU and/or PU being accepted. As Ajzen (1991) states, there should be a clear relationship between behavioural intention and actual system use. In terms of learning technology acceptance, an individual will be more likely to engage in its use if PEOU and/or PU are accepted in positive terms by that individual.

3.5.4 TAM’s strengths and weaknesses

With reference to the acceptance of learning technologies, it is argued that if an individual student user believes that a particular technology will be beneficial for their learning, and it is seen as straightforward to use, there will be greater likelihood of more participation and ultimately greater engagement (Edmunds et al. 2012). The same argument can be applied to academics: if a technology is viewed as easy to use and useful in their jobs, there is a greater prospect it will be accepted and become part of an academic’s teaching strategy.

TAM's linear structure can clearly demonstrate technology acceptance through a modified lens, such as in the examples provided above. Indeed, King and He (2006) using a meta-analysis strategy, observe that TAM has been proven to be a popular and statistically robust model particularly due to its qualities regarding transparency and simplicity. It is further argued that TAM possesses the potential and flexibility to be used more widely and in a variety of differing contexts (King and He 2006). As discussed in Chapter One, this particular study has taken advantage of TAM's flexibility to focus on understanding learning technology acceptance in HE students and academics.

However, it can be articulated that the perceptions of users regarding technology usage may change over time as they become more confident and familiar (Bhattacherjee and Premkumar 2004). Analysing the data collected over two longitudinal studies, Bhattacherjee and Premkumar (2004) discovered that student beliefs and attitudes towards technology usage changed to become more positive and optimistic. In addition, they found that satisfaction with a specific technology was a key factor in improving attitudes and beliefs.

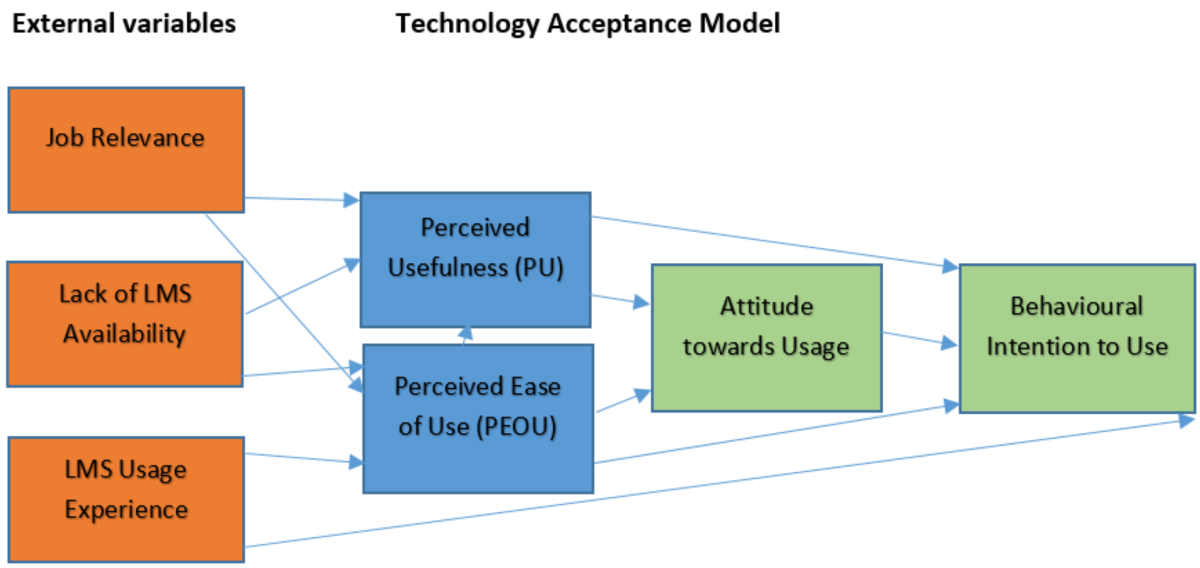
Moreover, although TAM can be viewed as a useful model, it still possesses the capacity to include further variables related to human and social change as well as the potential to construct an innovation model (Legris et al. 2003). Indeed, it is maintained that TAM is missing hedonic-use settings in contrast to utilitarian settings where it tends to flourish (Wu and Lu 2013). Although there is a certain degree of validity in these criticisms (particularly its imperfections in adapting to technological change and to an extent its parsimony) the criticism that its extensions are lacking in co-ordination and integration are arguably over-stated. Providing the content is co-ordinated and relevant, it is contended that TAM possesses the flexibility to be applied in various contexts such as in this research. Indeed, there are a number of links between TAM and other theories, which demonstrates its flexibility to be used in different situations. For example, Roca and Gagne (2008) identified a link between self-determination theory and TAM. As Roca and Gagne (2008) elucidate, self-determination theory (SDT) is connected to three main motivational needs: autonomy (an individual believing they are in control), competence (the effectiveness of someone in a particular context) and relatedness (feeling connected to other individuals). Roca and Gagne (2008) added a new category (playfulness) to the combination of TAM and SDT due to the interactive and enjoyable nature of utilising technology. This combined model arguably demonstrates that student perceptions of autonomy, competence and relatedness have an effect on PU and playfulness. These two aspects (along with PEOU) are powerful indicators of whether students decide (and continue) to use technology (Roca and Gagne 2008).

3.6 TAM in various research contexts

Although there have been a number of studies where TAM has been applied in quantitative research (such as Gefen and Straub 2000; King and He 2006; Schepers and Wetzels, 2007) there have also been several notable investigations using qualitative methods. As Vogelsang et al. (2013) contend, qualitative methods when applied to TAM are a valid strategy in creating new constructs of acceptance. For example, Ng et al. (2013) used semi-structured interviews when questioning student teachers in Hong Kong. They discovered that attitudes regarding the use of technology were directly related with a behavioural intention to use. In addition, Van Biljon and Renaud (2008) implemented structured interviews with respondents in order to analyse technology acceptance in mobile phone users.

Alharbi and Drew (2014) also utilised TAM to understand academics' behavioural intentions to utilise technology (specifically LMS) in a case study of Shaqra University in Saudi Arabia. There were three main external variables that had an impact on the decision to engage or not to engage with the LMS which are shown in Figure 15 overleaf:

Figure 15: External variables and TAM



Source: Based on Alharbi and Drew (2014)

Alharbi and Drew (2014) discovered that job relevance, lack of LMS availability and LMS usage experience contributed to the PU and PEOU of the LMS which ultimately affected the attitude toward usage and behavioural intention to use. As Dlalisa (2017) argues, the lack of academics who “buy-in” to an LMS can have serious consequences on whether it can be a success or not. Dlalisa (2017) in a study of 550 academics at the Durban University of Technology in South Africa observed that the LMS was mainly used for managing the course (for instance communicating with students through discussion forums) and least of all for assessments. Previous experience operating and managing a LMS was found as the main external variable that affected PEOU and subsequent attitude and behavioural attention to use. Dlalisa (2017) additionally found those academics with a positive perception of the LMS’s usefulness were more proficient and effective with its delivery than those who had a less positive perception (which was linked to a lack of experience or a mind-set that was more Instructionist and less supportive of the implementation and usage of LMSs).

Babie et al. (2016) further discovered that there are two main factors which inhibit technological acceptance in academics: individual competence and the educational environment in which the technology is practiced. Babie et al. (2016) add that academics' attitudes towards a particular technology are a significant predictor on whether they will lead to a positive behavioural intention to use. Furthermore, they state that educational values (whether a technology is viewed as the most appropriate tool to carry out an instruction), computer anxiety (an academic may be apprehensive about using technology due to a lack of experience or due a previous negative incident) may lead to a lack of self-efficacy and resistance to engage. Moreover, Babie et al. (2016) contend that course characteristics (if a course is deemed to be suitable to embed technology) and social influence (if other colleagues comment positively or negatively on the use of technology which may lead to the intention to use/not use) are further factors that can result in whether an academic decides to use, or not use technology to engage and communicate with their students.

Çubukcu et al. (2017) also employed TAM to analyse technology acceptance in 350 pre-service teachers from a faculty of education at a university in Central Anatolia in Turkey. They noted that both PEOU and PU had a significant influence on attitude, which in turn had an effect on behavioural intention to use.

In addition, Phua et al. (2012) used TAM to explore the behavioural intention of Malaysian Home Economics teachers to use technology in their classes. They found that behavioural intention was influenced by four main areas (in rank order): Internet Attitude, PU, PEOU and Perceived Enjoyment.

Finally, Chang and Tung (2008) combined TAM and IDT with a cohort of Taiwanese university students. They discovered that PEOU, PU, Perceived System Quality and Computer Self-Efficacy were all vital factors in influencing behavioural usage of technology. Similarly, Park (2009) in a study of Korean university students found that Computer Self-Efficacy was a critical construct in influencing technology usage followed by subjective norms, which influenced both PEOU and PU.

This thesis intends to build on the growing research discussed above by uncovering the specific reasons why students and academics accept and use a particular technology.

There have been several extensions of TAM since its creation: most notably TAM 2 and TAM 3.

3.7 Extensions of TAM - Technology Acceptance Model 2 (TAM 2)

As mentioned in the introduction to this chapter, extensions to TAM have been included in this literature review in order to provide a more contemporary viewpoint of technology acceptance. Venkatesh and Davis (2000) expanded the original TAM to create TAM 2 by adding the concept of PU and Intention to Use technology in connection to social influences and cognitive instrumental procedures. TAM 2 can be seen in Figure 16 below:

Figure 16: Technology Acceptance Model 2

Source: Venkatesh and Davis (2000)

TAM 2 demonstrates that PEOU and Result Demonstrability have a direct positive relationship with PU (Venkatesh and Davis 2000). Furthermore, Venkatesh and Davis (2000) state that Job Relevance and Output Quality have a moderating influence on PU. This is because the higher the quality of the output, the more powerful the effect Job Relevance will have on PU. For instance, if an individual achieves a high-quality result and the technology used is helpful to the task at hand, PU will become more pronounced.

Proponents of TAM 2 assert that it has been used successfully in organisational research (Venkatesh and Bala 2008). On the other hand, TAM 2 has been viewed as an overly parsimonious model that has overlooked the determinants of the decision making and action process (Bagozzi 2007). Bagozzi (2007) asserts that the addition of new variables to both TAM 2 and TAM 3: such as gender differences (as analysed by Gefen and Straub 1997); risk (Featherman 2001); social influence (Lee et al. 2006) and trust (Gefen et al. 2003) have broadened TAM as a framework rather than narrowing it. Bagozzi (2007) claims that these extensions tend to be uncoordinated and are lacking in integration. Furthermore, Bagozzi (2007) posits that there is no real understanding why any particular variable influences technology adoption. Although to some extent it is problematic to fully understand how specific variables influence technology acceptance, it is asserted that TAM 2 (or TAM 3 below) are not lacking in co-ordination. The variables in these frameworks are arguably suitable to be included and are particularly relevant to understanding technology acceptance in students and academics with Job Relevance and Output Quality especially appropriate. These models can be seen to be both flexible and helpful and add an extra dimension in understanding technology acceptance.

3.8 Extensions of TAM - Technology Acceptance Model 3 (TAM 3)

Venkatesh and Bala (2008) added to TAM 2 with the creation of TAM 3. TAM 3 includes a comprehensive network of all relevant determinants in users' IT adoption and subsequent use (Venkatesh and Bala 2008). The thick lines in Figure 17 overleaf illustrate the new relationships proposed by TAM 3:

Figure 17: Technology Acceptance Model 3

Source: Venkatesh and Bala (2008)

As can be seen above, there are three new relationships suggested by TAM 3: PEOU to PU moderated by Experience, Computer Anxiety to PEOU moderated by Experience and PEOU to Behavioural Intention moderated by Experience.

3.8.1 Perceived Usefulness moderated by Experience

Venkatesh and Bala (2008) contend that as a result of individuals gaining more experience with technology, users will possess more information on how simplistic or complicated a system is to use due to this past experience. For instance, if an academic or student has had experience of using a particular technology previously, this past experience and the knowledge that has been accrued will affect its current PU.

3.8.2 Computer Anxiety to Perceived Ease of Use moderated by Experience

Computer Anxiety is viewed to have an impact on PEOU with previous negative experiences seen to have an influence on current technological engagement. For example, students and academics who have had issues with technology in the past may be reluctant to use the same technology again due to this previous negative experience. Nonetheless, Computer Anxiety on PEOU will usually lessen after positive experiences of technology usage have been developed (Venkatesh and Bala 2008).

3.8.3 Perceived Ease of Use to Behavioural Intention moderated by Experience

The amount of experience a user has tends to moderate PEOU with regards to behavioural intention (Venkatesh and Bala 2008). This is because once users become accustomed to using a particular system, and accrue more experience, they will place less importance on PEOU and develop a more positive behavioural intention.

A more contemporary version of TAM can be seen in the Three Tier Use Model (3-TUM). This is presented and discussed on the next page:

3.9 Further extensions of TAM - Three Tier Use Model (3-TUM)

3-TUM displayed in Figure 18 below is arguably a more up-to-date framework (when compared to the Technology Acceptance Model) that can be used to understand individual attitudes to using technology:

Figure 18: Three-Tier Use Model

Source: Liaw (2007)

As can be seen in Figure 18 above, the Three-Tier Use Model (3-TUM) is a framework that incorporates a number of other perspectives such as SCT, TAM, motivation processes and TPB. This model is divided into three different tiers and proposes that each tier is able to influence the next tier. For instance, the individual characteristics and quality of the system is able to influence the affective and/or cognitive components of the learner. This tier is then able to influence the behavioural intention to utilise the actual learning technology (Pinpathomrat 2015). For example, Cigdem and Ozturk (2016) applied 3-TUM to question 155 Turkish university students in order to predict Behavioural Intention to use a LMS. They discovered that instruction had an influence on PEOU and PU with interactivity having an influence on student satisfaction. Furthermore, PU had a significant effect on the intention to use a LMS. Self-efficacy was not discovered to be a critical variable when compared to its relatively weak relationship with other constructs. Although this model has advantages in its simplicity (Khalid 2014; Cigdem and Ozturk 2016), it is arguably overly simplistic and has a lack of flexibility when compared to TAM. These limitations negated it from inclusion as the main theory to be used in the study although its lineal nature and clear structure were appealing.

The Unified Theory of Acceptance and Use of Technology (UTAUT) seeks to present a comprehensive theory of technology acceptance, focusing on social factors.

3.10 Unified Theory of Acceptance and Use of Technology (UTAUT 1 and 2)

The original Unified Theory of Acceptance and Use of Technology (UTAUT) model in Figure 19 below, focuses on the social aspect of technology acceptance (Venkatesh et al. 2003). UTAUT is composed of four main areas: Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Conditions as well as four moderating variables – Gender, Age, Experience and Voluntariness of use (Im et al. 2011). UTAUT has been applied to a number of different scenarios; such as university students' acceptance of technologies (Venkatesh et al. 2011). However, as Venkatesh et al. (2011: 527) state, UTAUT 'does not provide for situations where disconfirmation of expectations about key beliefs may occur and, consequently, influence outcomes such as behavioural intention and use'.

Figure 19: Unified Theory of Acceptance and Use of Technology 1

Source: Venkatesh et al. (2011)

Im et al. (2011) utilised the UTAUT model to understand the effects of culture on technological acceptance in the US and South Korea. They discovered that Effort Expectancy had a greater influence on Behavioural Intention in the US when compared to South Korea. As Im et al. (2011: 7) postulate, this finding may suggest ‘that the U.S. users’ decision-making on technology adoption is affected more than Korean users by how easy the technology is to use’. In addition, Oshlyansky et al. (2007) used UTAUT in a study of technology acceptance in students from nine different countries. They discovered that UTAUT was a suitable tool in capturing technology acceptance data from a variety of different countries with technological anxiety prevalent in students from Greece, South Africa and the UK.

Venkatesh et al. (2012) subsequently created UTAUT 2 (see Figure 20 below), adding further constructs and relationships and tailoring it more to consumer use:

Figure 20: Unified Theory of Acceptance and Use of Technology 2

Source: Venkatesh et al. (2012)

As can be seen above, there are three extra constructs in UTAUT 2 when compared to the original UTAUT model: hedonic motivation, price value and habit. Hedonic motivation is asserted as a critical determinant in influencing user behaviour and is a more influential driver than performance expectancy in non-organisational contexts (Venkatesh et al. 2012). It was also discovered that hedonic motivation had a greater impact on younger men who were less experienced using technology. Furthermore, price value is integrated to establish the effect of cost in technology usage. The price of the technology was a sensitive factor for users in deciding whether to use it or not (Venkatesh et al. 2012). Moreover, habit (instances in which users repeat their behaviour) was found to have a direct impact on technology use and an indirect effect via Behavioural Intention. For example, it was observed that older men with more experience tended to use technology habitually (Venkatesh et al. 2012). Overall, UTAUT 2 includes the original UTAUT aspects in addition to the new constructs discussed above and instead relates them more closely to a technology consumption context. Arguably, the facilitating conditions aspect of UTAUT is of particular relevance to this study as it can be associated with university support. This aspect refers to the extent to which a user believes that they are supported by an effective organisational and technical infrastructure (Venkatesh et al. 2003).

3.11 Hedonic Motivation System Adoption Model (HMSAM)

HMSAM (see Figure 21 on the next page) was developed with the rationale that TAM was not a suitable model in effectively investigating intrinsic motivation (Lowry et al. 2013). HMSAM is primarily utilised to understand the adoption of hedonistic motivation systems that are used to satisfy individual intrinsic motivations (Lowry et al. 2013). Lin and Bhattacherjee (2010) concur when arguing that TAM may not be useful in understanding usage of non-utilitarian (for instance hedonic) systems. These intrinsic motivations can include learning and are grounded in flow-based cognitive absorption (Lowry et al. 2013). This model is useful as it contains a key variable related to technology acceptance (hedonism/enjoyment) that was not present in TAM. The rationale for including this construct in my conceptual framework will be discussed later in Chapter Seven.

Figure 21: Hedonic Motivation System Adoption Model

Source: Lowry et al. (2013)

The Technology, Pedagogy and Content Knowledge Model (TPACK) will now be discussed and evaluated in order to further understand technology acceptance in academics and how technology is integrated into the curriculum. I found this model to be particularly relevant as it focuses on technology acceptance from a pedagogical perspective.

3.12 Embedding technology into the curriculum - Technology, Pedagogy and Content Knowledge (TPACK)

This study concurs with the findings of Price and Kirkwood (2014) who articulate that HE lecturers should be aware of research into current pedagogical practices in order to inform their teaching and meet the expectations of their students. On the other hand, many contemporary approaches that integrate technology into the curriculum tend to be techno-centric and do not always effectively consider the various processual relationships, different pedagogical styles and environmental contexts

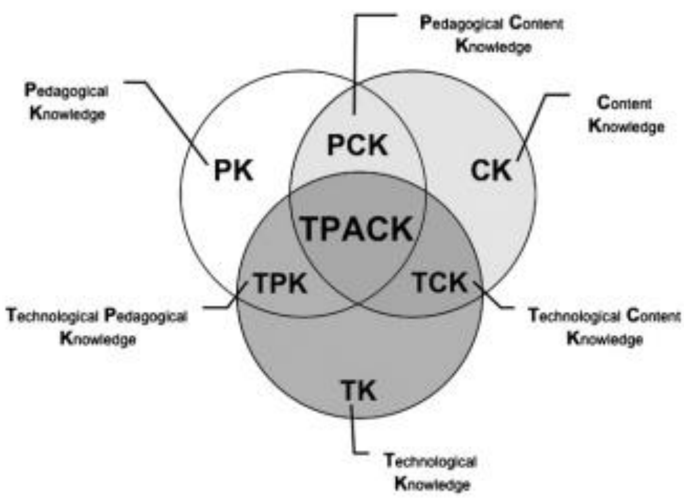
(Harris et al. 2009). Harris et al. (2009) claim that there is a gap between the vision of transformative technologies and what actually transpires in the classroom. This point resonates from the lesson observations I have conducted at CUL with a lack of innovation and consistency in pedagogical design evident.

Universities worldwide commonly offer courses to improve teacher understanding and delivery by either face-to-face or online methods (Harris et al. 2009). These courses are created to improve the quality of the learning experience for students and for the development of the academic implementing the technology. However, there is often a lack of a recognised framework utilised in enhancing the delivery of technology by teachers. The Technology, Pedagogy and Content Knowledge framework (TPACK) can be used to address this gap. Graham (2011: 1953) states:

> *'The technological pedagogical content knowledge (TPACK) framework is increasing in use by educational technology researchers around the world who are interested in issues related to technology integration'.*

The TPACK framework (see Figure 22 below) augments three interdependent components of teacher knowledge (Harris et al. 2009). These are; Content Knowledge (CK), Pedagogical Knowledge (PK) and Technological Knowledge (TK):

Figure 22: The Technological Pedagogical Content Knowledge framework



Source: Graham (2011)

Mishra and Koehler (2006: 1026) explain that Pedagogical Knowledge (PK) can be regarded as:

> *'Deep knowledge about the processes and practices or methods of teaching and learning and how it encompasses, among other things, overall educational purposes, values, and aims. This is a generic form of knowledge that is involved in all issues of student learning, classroom management, lesson plan development and implementation. It includes knowledge about techniques or methods to be used in the classroom; the nature of the target audience; and strategies for evaluating student understanding.'*

Content Knowledge (CK) is defined as knowledge about the subject that is being taught as well as frameworks that connect and organise ideas and assumptions (Mishra and Koehler 2006). Moreover, Technological Knowledge (TK) is explained by Mishra and Koehler (2006: 1027) as 'knowledge of operating systems and computer hardware, and the ability to use standard sets of software tools such as word processors, spreadsheets, browsers, and e-mail. TK includes knowledge of how to install and remove peripheral devices, install and remove software programs, and create and archive documents'. Pedagogical Content Knowledge (positioned in the centre of content and pedagogy) is concerned with the connection of content and pedagogy, particularly how different components of a subject are organised, adapted and presented (Mishra and Koehler, 2006: 1021). Mishra and Koehler (2006: 1028) state 'Technological Pedagogical Knowledge is knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings, and conversely, knowing how teaching might change as the result of using particular technologies'.
Technological Content Knowledge (TCK) is defined by Mishra and Koehler (2006: 1028) as possessing the requisite knowledge about how technology and the subject matter are inter-connected. This is particularly relevant to new technologies. Finally, Mishra and Koehler (2006: 1028) explain:

> *'The basis of good teaching with technology requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new epistemologies or strengthen old ones'.*

Arguably, incorporating TPACK will allow me to investigate the extent to which technology is deemed to be an important pedagogical tool by academics as it includes technological, pedagogical and content knowledge aspects that can all be used in ascertaining technological acceptance. This thesis concurs with Abbitt (2011:134) who claims that it is both important and complicated for teachers to keep up with technology due to it being a moving target, ephemeral and continuously advancing. Nonetheless, Ertmer and Ottenbreit-Leftwich (2010: 261) assert that self-effectiveness beliefs, knowledge of technology and understanding of cultural contexts on technology integration are all vital components and although 'knowledge of technology is necessary, it is not enough if teachers do not also feel confident using that knowledge to facilitate student learning'. The lack of knowledge teachers possess on the "T" part of TPACK is a major barrier to its integration in the classroom (Mishra et al. 2010). However, it is posited that teachers must be familiar with more than the technical aspects of technology and need to be able to understand its strengths and weaknesses in presenting engaging content and its relevance to specific pedagogical approaches (Harris et al. 2009).

Although teachers operating 20 years ago could easily be regarded as effective practitioners without implementing technology in their classes, this situation is no longer the case with many scholars arguing that effective teaching is only possible when technology is effectively embedded due to its benefits in engaging modern learners (Ertmer and Ottenbreit-Leftwich 2010). While there has been a great deal of research on what teachers need to know about learning technologies, there has been little attention paid on how they are able to learn about it (Koehler and Mishra 2005; Wetzel et al. 2014). TPACK can alleviate this issue as it will allow me to understand technology acceptance in detail from the academic perspective.

The final section of Chapter Three will now provide a rationale for the employment of TAM as the primary framework to be used in this study.

3.13 Why TAM?

Although TAM possesses several inherent weaknesses as detailed above and is arguably rather outdated, it is nevertheless viewed as the most appropriate framework to use in this research due to its usefulness in identifying common themes and possessing a linear structure in understanding the acceptance of learning technologies. TAM is also argued as flexible as it can be redesigned and modified to the topic of this thesis. Moreover, SCT, TRB and TRA (and 3-TUM as a consolidated model) are all asserted as useful and established theories in influencing TAM’s construction and subsequent variants.

3.14 Chapter Three summary

Chapter Three has discussed the specific theoretical frameworks utilised in this thesis. Innovation Diffusion Theory was first analysed followed by Social Cognitive Theory. The Theory of Reasoned Action and the Theory of Planned Behaviour were then discussed. After that, TAM was critiqued in detail. Extensions of TAM: TAM 2 and TAM 3 were then evaluated. The Unified Theory of Acceptance and Use of Technology (UTAUT 1 and 2) were also discussed and evaluated followed by the Hedonic Motivation System Adoption Model (HMSAM). The Technology, Pedagogy, and Content Knowledge Model (TPACK) was then examined. The chapter concluded with a justification for the use and application of TAM in the thesis.

Chapter Four will now critically evaluate the research design used in the thesis focusing on the benefits of using CGT.

Chapter Four - Research Design

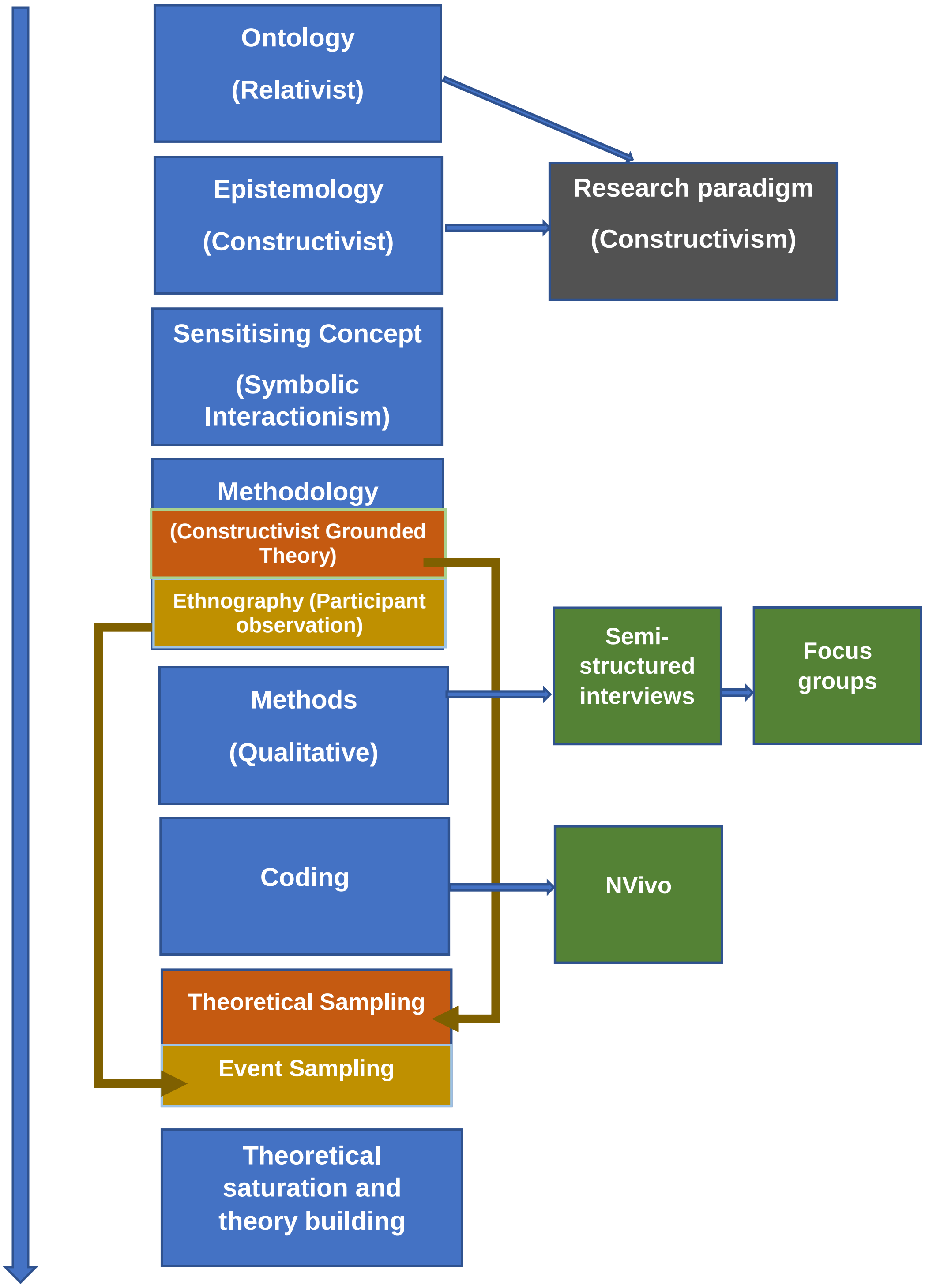
4.0 Introduction to Chapter Four

Chapter Four discusses and analyses the philosophical position that subsequently informs the methodology and methods being used. This chapter provides a rationale for the use of CGT, justifying it as the most appropriate methodology to be used in this thesis due to its ability to explore human experiences, generate theory and align with my own Constructivist philosophical beliefs. Although previous research of studies on student engagement has used Classical GT (such as Feeler 2012; Cullingworth 2014; Tweedy 2015), Glaserian (Hernandez 2010) and Straussian GT (Thai et al. 2011) there have been limited studies using CGT and none that have explored the acceptance of learning technologies in university students and academics. This research seeks to address this gap by uncovering rich and descriptive responses to better understand the technology acceptance relationship involving both students and academics.

First, ontological, epistemological and methodological considerations are presented in order to situate the methods that are used. The process of eliminating other methodologies are detailed as potential processes and justification to my choice of methodology is given in this chapter. The history and evolvement of classical GT are then elucidated as well as current thinking and the philosophical disagreements that are dominant within this methodology. This section is followed by a comprehensive rationale for the implementation of CGT in this thesis. The use of Ethnography is then discussed followed by a justification of specific qualitative methods that have been applied to deliver the rich and descriptive data required to answer each of the research questions. After that, the data collection, analysis and piloting process are critiqued followed by a discussion on ethical considerations and a critical examination of the sampling procedures that took place. The chapter continues by delivering a critical discussion of the coding that is used and explains how memo writing was integrated into the research design. The chapter concludes by providing an examination of reflexivity and a discussion on the validity, reliability and generalisability of the data that was collected.

The structure and design of each part of the research strategy can be seen in Figure 23 below:

Figure 23: Research Selection and Strategy



4.1 Ontological and epistemological considerations

As Crotty (1998) explains, an ontological perspective describes the nature of being and concerns the nature of reality and how this is perceived by individuals. The first question to be considered in this thesis was if student and teacher engagement and motivation to use learning technologies could be objectively measured, implementing a realistic ontology, or if this topic is more aligned to a subjective relativist ontology that elucidates different meanings for different actors. As Crotty (1998) articulates, there has been a debate on which approach; realism or relativism, is most appropriate to be used in various fields of study. Realists believe in the existence of one truth that does not change and can be measured in objective terms. When the 'truth' is discovered, it can be generalised and applied to other situations. This belief then influences every subsequent decision in the study (Crotty 1998). On the other hand, relativism can be regarded in very different terms to realism. This is because relativists believe in multiple realities and meanings are shaped by an individual's context. Truth from the relativistic perspective can be seen as moveable and not static. Truth is viewed as continuously evolving and changing and cannot be generalised and only transferred to similar contexts (Guba and Lincoln 1994).

Therefore, a relativist (rather than a realist) ontological stance was adopted in this study as I propose knowledge on learning technologies is a social construct that is learned through individual interpretations and experiences correlating to the arguments of Guba and Lincoln (1994) and Crotty (1998). Indeed, it is my assumption that students and academics have had different experiences with learning technologies, both positive and negative, in various contexts that has resulted in different, subjective meanings of reality being created. I contend that this reality has been constructed subjectively via meanings and understandings and has been developed socially and through different experiences.

4.1.1 Epistemological approach

Before providing the reasons behind selecting my chosen epistemological approach, it is helpful to give a definition and background of epistemology and how it fits within my research strategy. Crotty (1998: 3) defines epistemology as:

> `*The theory of knowledge embedded in the theoretical perspective and thereby in the methodology ... An epistemology ... is a way of understanding and explaining how we know what we know'.*

Furthermore, Guba and Lincoln (1994) affirm that epistemology is a branch of philosophy that focuses on the theory and study of knowledge. They proffer that epistemology concentrates on understanding what knowledge is, in what ways it is learned, what individuals know, as well as identifying how people know what they know. However, there has been a lack of agreement between scholars on what epistemology actually is. For instance, Crotty (1998: 10) postulates that ontology and epistemology are difficult to separate as they tend to be related to each other or 'emerge together'.

Nonetheless, for the purpose of this thesis epistemology is defined as 'how we know what we know' (Crotty 1998: 8) with its presence along with ontological, axiological[19] and methodological assumptions viewed as a consistent and popularly accepted system by researchers (Guba and Lincoln 1994: 105; Creswell 1998: 74-77).

This thesis adopts a Constructivist epistemological perspective as I propose knowledge and reality are constructed by unique social relationships and interactions (Crotty 1998). With relevance to this thesis, it is argued that both students and academics have had different and individualistic experiences of using technology which have subsequently affected technology acceptance.

Initially, five research paradigms were considered in this research: Positivism, Post-positivism, Interpretivism, Re-constructionism and Constructivism.

[19] A branch of philosophy dealing with values, ethics, aesthetics or religion (Crotty 1998).

4.2 Research paradigms

There are a number of research paradigms, which are connected to other associated dichotomous research methodologies such as quantitative and qualitative methods as well as deduction and induction. This section provides a detailed discussion on the different research paradigms I considered in this thesis. In this part of the thesis, I will analyse the strengths, weaknesses and relevance of Positivism, Post-positivism, Interpretivism, Re-constructionism and Constructivism.

4.2.1 Positivism

Firstly, I will discuss the merits and disadvantages of implementing the positivist paradigm, particularly with regard to extant literature and its relevance to this research. Positivism is a perspective that first originated through the work of Comte (Alexander 2014). As Easterby-Smith et al. (1991) and Creswell (2012) discuss, Positivist approaches popularly utilise quantitative tools such as questionnaires to quantify knowledge in objective, scientific and identifiable terms. Indeed, Taylor and Medina (2013: 1) describe Positivism as:

> *'A research paradigm that is very well known and well established in universities worldwide. This "scientific" research paradigm strives to investigate, confirm and predict law-like patterns of behaviour, and is commonly used in graduate research to test theories or hypotheses. This is particularly useful in natural science, physical science and, to some extent, in the social sciences, especially where very large sample sizes are involved. Generally its focus is on the objectivity of the research process.'*

Although there are a number of established benefits to be had when implementing the Positivist paradigm: such as its ability to analyse large samples, increase objectivity as mentioned above, and enhance structure by following a set of rules (Schrag 1992), there are other more important reasons why it was not implemented in this research. The main reason why a Positivistic paradigm was not selected is its inability to effectively analyse individual behaviour. The Positivist paradigm articulates that objectivity can be achieved if the individual conducting the research remains objective and visceral (Crossan 2003). However, it was decided that this scenario was not possible to achieve or guarantee in the interviews with students, academics and senior management and in the focus groups with students and learning technologists. Moreover, the Positivist paradigm tends to be inflexible, as it believes data can be scientifically measured with Positivists generally disregarding unexplained phenomena and viewing situations as they are (Schlick 1991; Alexander 2014). As I need to discover the detailed perspectives of both students and academics regarding their acceptance of learning technologies it was concluded that this restriction would be unhelpful in generating the amount of fresh, rich and descriptive data that was needed.

Moreover, Positivist quantitative research focuses on the measurement and analysis of variables within a value-free framework and does not attempt to understand social processes (Denzin and Lincoln 2005). This was a major limitation that made me decide not to implement a Positivist approach, as I need to understand the thoughts, feelings and perceptions of my interviewees and focus group participants. Furthermore, it is my philosophical belief that human interactions do not occur within a value-free framework, as elucidated by Denzin and Lincoln (2005) and instead take place as part of a social process. In addition, this study needs to uncover and understand subjective data from participants to create theories and recommendations for future research. In summary, the Positivist paradigm would not enable me to effectively analyse the social process of adopting learning technologies from a student and academic perspective as the end result would be factual, static and quantified.

4.2.2 Post-positivism

Post-positivism evolved from Positivism and extols a deterministic philosophy, although unlike classical Positivism, Post-positivism does not accept that there is an absolute truth (Creswell 2003). Kuhn (1962) and latterly Popper (1968) developed the Post-positivist philosophy when providing a critique of Positivism. Kuhn (1962) elucidated the concept of a paradigm shift where theories are viewed within much larger worldviews (which are termed as ‘paradigms’). These paradigms ultimately shift when confronted with growing evidence conflicting with the existing theories. Popper (1968) articulated the concept of hypothesis falsification; in that hypotheses can never truly be objective and only falsified and refuted. Therefore, the Post-positivist philosophy allows researchers to create and test hypotheses that will ultimately be flawed. As a result, the Post-positivist philosophy views the nature of reality to be unattainable with the intention to discover the closest possible definition its main objective. This philosophy tends to lend itself well to quantitative methods as it focuses on the formulation and testing of hypotheses (Popper 1968).

Similar to the justification for the rejection of Positivism detailed above, I decided that the use of a Post-positivist philosophy would not allow me to uncover the reasons behind the adoption of learning technologies, as the end result would be quantified. In this research it was vital to utilise a philosophy that would enable me to discover ‘how’ and ‘why’ rather than ‘what’ which Positivist and Post-positivist philosophies lend themselves more closely to.

4.2.3 Re-constructionism

As Cohen (1999) elucidates, Re-constructionism (also known as ‘Critical Theory’) is a philosophy that focuses on addressing challenging social questions in order to enhance society via a targeted curriculum. This curriculum tends to be wholly focused on improving the student experience and usually deals with controversial issues through community-based learning (Mosier 1951). Students learn by social activism and typically spend half of their time outside of the classroom.

Although this philosophy has its advantages in allowing educators to design curricula in any way they deem suitable and is arguably useful in improving the student experience, I decided the subject of technology acceptance in students and academics would not be the best fit for this philosophy. The participants in my study will spend most of their time in the classroom and in a university environment. Moreover, I believe my topic cannot be regarded as controversial and is more suited to a Constructivist approach as will be articulated later in this chapter.

4.2.4 Interpretivism

Interpretivism, is defined as the need for reality to be interpreted (Guba and Lincoln 1994). Interpretivism is regularly associated with the research of Max Weber who posits that human sciences are primarily concerned with understanding and explaining a given subject based on causality (Crotty 1998). The Interpretivist paradigm states that there are a number of relative realities. These realities are dependent on different systems in understanding meanings (Lincoln and Guba 1985). This situation makes it challenging to interpret fixed realities. Interpretivists construct knowledge in social terms, which although rich and deep, lack the objectivity of Positivist approaches (Neuman 2005).

Moustakas (1994: 21) postulates that there are seven qualities that the Interpretivist paradigm possesses. As can be seen in Table 5 underneath, these include:

Table 5: Seven qualities of Interpretivism

1. The ability to focus on an experience in its entirety instead of its objects or parts of an experience. 2. Issues and specific questions can be created that inherently reflect the involvement, commitment and interests of the researcher. 3. Both formal and informal discussions can be used to collect the actual experiences of interviewees. 4. Qualitative designs and methodologies are valuable in approaching and analysing human experiences. 5. The day of the actual experience is essential in understanding human behaviour. This can then be used as evidence for scientific research. 6. The Interpretivist paradigm enables researchers to understand the underlying meanings of experiences rather than simple measurements as in Positivism. 7. The experience of participants is integrated and there is an inseparable relationship between subjects and objects. These are formed either in part or as a whole.

Furthermore, the Interpretivist approach focuses on more flexible research methods and is less concerned with adopting a structured framework (Carson et al. 2001).

Interpretivists are mainly motivated with understanding the various meanings within human interaction and in trying to understand how reality is actually perceived in a specific context (Black 2006; Carson et al. 2001). The collaboration which occurs between the researcher and participants is connected to Interpretivist principles. This is because Interpretivism views individuals as possessing the capability to adapt to change through collaborative activities (Hudson and Ozanne 1988; Bhattacherjee 2012). The Interpretive paradigm allows humans to be researched as instruments (Lincoln and Guba 1985: 39). As Easterby-Smith et al. (1991: 24) elucidate, it is important to value verbal feedback, which is constructed socially and given significance by people.

I concur with the arguments of Hudson and Ozanne (1988) who assert that there is a mutual and interdependent relationship between Interpretivist researchers and participants. For example, the researcher is viewed as possessing a general level of understanding of the research before it takes place. However, this prior understanding is generally inadequate, as realities are perceived in multiple ways by participants (Hudson and Ozanne 1988). On the other hand, it should be acknowledged that Interpretivism does not attempt to predict or generalise the causes and effects behind human behaviour (Hudson and Ozanne 1988). Therefore, the goal is to understand the meanings, reasons and motivations in individual behaviour, which is bound by time and context (Carson et al. 2001).

Although I was attracted by the Interpretivist philosophy due to its ability to analyse human interaction, I decided that Constructivism was the most appropriate paradigm to use in my research. Although there are similarities between Interpretivism and Constructivism and both terms are often used interchangeably by academics (Hammersley 2012), there are nevertheless a number of differences, which will be noted in the next section when contending Constructivism is the most appropriate theoretical perspective to adopt.

4.2.5 Research paradigm selection - Constructivism

Constructivism is affirmed as particularly relevant to this study due to social science being the subject under investigation. In contrast to Interpretivism, which believes that there are different interpretations of reality, Constructivism assumes that reality is socially constructed (Creswell et al. 2007). As Bhattacherjee (2012) states, social science can be regarded as the science of people, with it being possible to classify this subject into specific disciplines and related behaviours (such as psychology and associated human behaviours). However, due to the amount of uncertainty that exists regarding the accuracy of social science issues, Bhattacherjee (2012) asserts that researchers must be prepared to deal with large amounts of ambiguity and error throughout the research process and must endeavour to understand how participants genuinely feel about a particular issue.

The Constructivist paradigm explains how individuals construct and understand their own particular situation. This means that social phenomena is created due to human interpretation of the events they experience (Crotty 1998). It is my contention that humans construct their own individualistic systems of knowing as argued by Kim (2001). Academics, such as myself, should respond to these systems rather than deliver their own particular models in the classroom. This phenomenon is unable to be quantitatively measured, as it is qualitative in nature. The Constructivist approach looks to understand a particular situation as well as values and authentic experiences. This contrasts with Positivism, which is more objective and more concerned with identifying explanations and confirming or disproving hypotheses (Crotty 1998). Thus, the use of a Constructivist paradigm will provide me with the opportunity to discover the student and academic perspective on what particular learning technologies are most useful in facilitating technology acceptance and how each user negotiates their own realities.

Indeed, Stake (1995: 99) maintains that Constructivism informs a qualitative case study as ‘most contemporary qualitative researchers hold that knowledge is constructed rather than discovered’. I agree with Stake (1995) who regards researchers as individuals who interpret information, which in turn necessitates them to detail their construction of the knowledge that they collect as a result of their research. A further construction of knowledge occurs when readers digest and assimilate the information presented on the finalised report with knowledge constantly going through a set of filters as it is never fixed and always changing, liquefying and morphing (Stake 1995). Furthermore, Merriam (1998: 6) claims Constructivism is the closest paradigm to qualitative research as:

‘The key philosophical assumption upon which all types of qualitative research are based is the view that reality is constructed by individuals interacting with their social worlds’.

Moreover, Merriam (1998: 22) states that ‘reality is not an objective entity; rather, there are multiple interpretations of reality’. This argument dovetails with my own ontological position and research strategy for this thesis discussed in 4.1 above. As a result, it is argued, using the definitions of Merriam (1998) that it is vital for qualitative researchers such as myself to clearly understand the knowledge and meanings that are constructed by individuals. It is also acknowledged that it may never be truly possible to clearly understand these constructions. Nonetheless, it is contended that one of the main foci of qualitative researchers is understanding how and why individuals make sense of their experiences (such as students and academics with learning technologies). As Merriam (1998: 22) comments:

‘The researcher brings a construction of reality to the research situation, which interacts with other people’s constructions or interpretations of the phenomenon being studied. The final product of this type of study is yet another interpretation by the researcher of others’ views filtered through his or her own’.

Constructivism permits researchers to be actively involved in the construction of reality with participants in contrast to Interpretivism, which assumes that the researcher should collect interpretations of reality from those they interact with (Crotty 1998). Furthermore, Constructivism will result in participants being able to construct or create their own subjective understanding of objective reality (Crotty 1998).

Thus, the Constructivist approach will allow me to investigate in detail what specific interactive learning technologies motivate students to engage with their subject, to what extent nationality is pervasive in engagement as well as how students and teachers differ in their attitudes to the perceived efficacy and adoption of learning technologies. This strategy follows the premise that ‘meanings are constructed by human beings as they engage with the world they are interpreting’ (Crotty 1998: 43).

In ontological terms, this study views students and academics as constructing their own subjective, different and multiple meanings of their experiences with learning technologies. Concurrently, myself as the researcher, will be looking for ‘the complexity of views rather than to narrow the meanings into a few categories or ideas’ (Creswell et al. 2007: 20) in order to shed new light on what particular technologies motivate specific nationalities and if there is a disconnect between student and teacher attitudes.

The link between Constructivism, Symbolic Interactionism and GT is discussed below. Symbolic Interactionism is evaluated first.

4.2.6 Symbolic Interactionism

Symbolic Interactionism is viewed as an appropriate sensitising concept in this study due to its coherence with Constructivism and that it is helpful in informing the overall research problem (Charmaz 2003). As Glaser (1978) argues, sensitising concepts draw attention to integral aspects of social interaction and deliver guidelines for how research is to be conducted in specific contexts. This is also argued as a good fit for the inductive nature of this study (Lincoln and Guba 1985).
Symbolic Interactionism is arguably associated with GT in that it suggests social life should be studied through ‘first-hand observation’ (Blumer 1969: 38). Moreover, Symbolic Interactionism involves the testing of categories and resultant creation of theory correlating to the methodological principles of Glaser and Strauss (1967) and Glaser (1978).
Symbolic Interactionism originated from the work of Blumer (1969) and was based upon Mead’s two stated forms of social interaction: the use of gestures and symbols. Blumer (1969) elucidates the use of gestures refer to the interaction process and what causes individuals or other parties to act. When these gestures accomplish the same meaning to the individuals and others, these now assume the role of a symbol (Blumer 1969). In addition, individuals are viewed as actors who are necessitated to act in specific situations that require a particular action. Blumer (1969) contends that there are three major aspects inherent in Symbolic Interactionism. These are:

1. Individuals act when something has meaning for them.
2. Meaning comes from social interaction with other parties.
3. Meanings are changed through a process of interpretative social interaction.

Symbolic Interactionism can therefore to be seen as useful in underpinning GT (Strauss and Corbin 1990; Charmaz 2000). Moreover, it is contended that Symbolic Interactionism is aligned to this thesis as ‘interaction is inherently dynamic and interpretive and addresses how people create, enact and change meanings and actions’ (Charmaz 2006: 7).

The background and benefits of adopting a GT approach are detailed below followed by a critical examination of the different types of GT.

4.3 The Relevance of Grounded Theory

As mentioned above, this study will implement CGT as the main methodological approach due to its ability to analyse social processes (Glaser and Strauss 1967; Strauss and Corbin 1990). However, to understand the reasons behind this rationale it is necessary to provide the background to Classical GT and how CGT has evolved since the seminal work of Glaser and Strauss (1967) and latterly through the studies of Glaser (1978) and Strauss and Corbin (1990).

There are four main recognised GT models. These are Classical GT (Glaser and Strauss 1967), Glaserian GT (Glaser 1978), Qualitative data analysis (QDA); also known as Straussian GT (Strauss and Corbin 1990) and CGT (Charmaz 2000; 2006).

The history of GT is discussed first followed by the benefits of adopting a GT approach and its relevance to this study. A detailed overview of Glaserian GT and Straussian GT are then discussed before a justification for the implementation of CGT is provided.

4.3.1 The History of Grounded Theory

The original version of GT established by Glaser and Strauss (1967) was influenced by Positivism and rooted in Pragmatism and Symbolic Interactionism. Since their seminal discovery, Glaser and Strauss went on to develop different philosophical approaches. Glaser (1978) introduced a broader methodology in which all data should be compared and contrasted. Glaser (1978) states that this should not be limited to purely qualitative methods but instead to all forms of data creation including surveys and statistics. On the other hand, Strauss and Corbin (1990) adopted a different approach when suggesting that induction, deduction and verification are vital when focusing on qualitative methodology that is influenced by Pragmatism and Symbolic Interactionism (Charmaz 2014). Glaser (1992) refutes this study by arguing that GT can be inductive only. Since then, Wuest (1995: 127) has applied the feminist perspective to GT and argues there is an epistemological congruence as both perspectives espouse multiple explanations of reality. Wuest (1995) adds that there is a further connection as women are experts regarding their own experience and this subjective experience can be regarded as valid data. Following this, Charmaz (2000) originated CGT, which is embedded in qualitative analysis and involves the co-construction of knowledge with respondents. Strauss and Corbin (1998: 40) assert:

> *'If someone wanted to know whether one drug is more effective than another, then a double blind clinical trial would be more appropriate than Grounded Theory study. However, if someone wanted to know what it was like to be a participant in a drug study [..], then he or she might sensibly engage in a Grounded Theory project or some other type of qualitative study'.*

As the above quotation demonstrates, GT is a valuable methodology in understanding human perceptions and feelings on a particular topic. Although quantitative data has its own advantages in terms of objectivity and its ability to measure and compare large numbers of data, GT is beneficial in uncovering more data about individual opinions, thoughts and perceptions, which clearly relates to the four research questions in this study.

4.3.2 Grounded Theory background and benefits

As Strauss and Corbin (1990: 24) state, GT is ‘a qualitative research method that uses a systematised set of procedures to develop and inductively derive GT about a phenomenon’. GT originated from the research of Glaser and Strauss (1967) who shifted the way of thinking from a hypothetical-deductive strategy to a theory-building inductive approach that was grounded in data. This theory necessitated that researchers must start any project with an open mind and without reviewing any existing academic literature so that an inductive study is able to be executed (Glaser and Strauss 1967).

As Glaser and Strauss (2009) opine, GT is popularly utilised in social sciences to create theory as a result of analysing data. Indeed, GT can be regarded as almost the opposite of Positivist research. This is because it often starts with a specific question or qualitative data. Repeated ideas or concepts are then found by reviewing the data and by identifying certain patterns (Martin and Turner 1986). This data is then coded with more data subsequently gathered and reviewed again with the codes separated into different concepts and categories. These categories then become part of establishing a new theory (Faggiolani 2011). GT is useful in interpreting social interaction between different actors and the inter-relationship between meaning in the perception of those involved and their actions (Glaser 1992). As I will discuss later in the chapter, it is my belief that engagement with learning technologies is a social process with social interaction a key aspect of this process. GT further suggests that humans are able to interpret their surroundings, via the meaning of symbols and the individuals who interact with them, and is used to explain and discover new ways of thinking of the behaviours that humans display which are created from the understanding of these symbols (Glaser 1992). Stebbins (2001: 4) asserts that GT is ‘broad-ranging, purposive, and systematic’ and Charmaz (2006) claims systematic processes that include the collection and analysis of data, as well as the continuous comparisons of logic and theory that is derived from data gives GT a high degree of rigour which cannot be discovered in other qualitative approaches. Charmaz (2006: 2) adds ‘by adopting Grounded Theory methods you can direct, manage, and streamline your data collection and, moreover, construct an original analysis of your data’.

Arguably, GT allows researchers to collect rich, detailed and descriptive data that provides the researcher with a sufficient amount of information to construct a robust analysis of the respondents' social and subjective life (Charmaz 2006). GT can also be regarded as a vigorous methodology as it utilises a number of integrated stages of research in how to gather, collect and disseminate data (Glaser and Strauss 1967). Moreover, GT is argued as different to other qualitative approaches due to using a method of constant comparison of data, which is subsequently coded, compared and contrasted (Glaser and Strauss 1967). Unstructured interviews are recommended to allow the interviewer to discover the subjective opinions of respondents in sufficient detail (Glaser and Strauss 1967). The subsequent theory is grounded as it is discovered by the interviewer and has not been formed by any previous suppositions (Charmaz 2006; Glaser and Strauss 1967). Thus, the data emerges as a result of the research. One of the most important aspects of following a GT approach is to not conduct a literature review until the theory has been developed (Glaser and Strauss 1967).

Furthermore, GT arguably increases and fosters creativity as it permits researchers the opportunity to derive meanings from the data using creative and inductive processes (Myers 2009). This is important to explore existing and new problems from a different perspective as well as to challenge the dominant discourse and to suspend widely held beliefs. Additionally, GT is helpful in generating concepts that are often easy to conceptualise due to the researcher's involvement in the data collection and data development relationship (Glaser 1992). This theory can be viewed as unique when compared to other qualitative approaches, as it is the only one that emphasises the development of theory (Glaser and Strauss 2009). Arguably, the most significant benefit of using GT is its capability in creating theory that is generated from data mined in social research (Glaser 1992).

GT also enables the researcher to discover the context and structure behind the lives of participants and to understand their feelings on a given topic as well as their intentions and actions (Charmaz 2006). In addition, Charmaz (2006: 15) contends that GT provides tools to make 'sense of the data' and refines it to uncover what is beneath the surface. Similarly, it is beneficial in collecting the participants' views of a particular subject and forces the researcher to review collected data and to refine emerging theoretical frameworks in order to create new categories and concepts.

On the other hand, Hussein et al. (2014) proffer there are five major drawbacks when using GT: the fact that it is an exhaustive process, its potential for methodological mistakes, reviewing the literature without developing assumptions, there are a number of approaches to it and it possesses limited generalisability. Moreover, the coding that is involved in any GT process can often be time-consuming, laborious and exhaustive (Myers 2009). Myers (2009) adds that GT tends to generate lower quality theories that have several limitations. There can also be issues with reliability and generalisability if the researcher decides to only use one source of qualitative research, such as interviews (Charmaz 2006). Therefore, Glaser (1992) recommends to conduct more than one form of qualitative research (interviews, focus groups and non-participant observation are used in this study) to prevent methodological errors from occurring.

In addition, Corbin and Strauss (2008: 36) caution it is unhelpful to write the literature review before analysis as this can often lead to confirmation bias. They add that there is always ‘something new to discover’ and that researchers should limit their reading before utilising GT in order to reduce potential biases. Although there is some validity in this argument, I believe it is necessary to have read the literature first in order to inform the questions that will be used in interviews and focus groups. Semi-structured rather than unstructured interviews are also viewed as more effective in generating greater flexibility through probing (Bryman and Bell 2015; Saunders et al. 2011). The rationale for this selection is discussed in more detail later in the chapter.

Hussein et al. (2014) state there are currently multiple approaches to GT with Glaser and Strauss (the originators) now proposing different epistemological and ontological viewpoints. For instance, Glaser is more influenced by the quantitative positivist approach whereas Strauss is a proponent of the qualitative Interpretivist paradigm. As Hussein et al. (2014: 8) comment:

> *‘The issue of generalisation is less frequently discussed in qualitative research, and is considered complicated and controversial because the main goal of qualitative research is to provide a rich and contextualised understanding of the human experience’.*

Ayres et al. (2003: 881) add that ‘just as with statistical analysis, the end product of qualitative analysis is generalisation, regardless of the language used to describe it’. However, it can be challenging to generalise qualitative results due to issues with reliability and validity (Hussein et al. 2014).

The next section will discuss the merits and weaknesses of different types of GT before providing a rationale for the application of the Constructivist approach.

4.3.3 Types of Grounded Theory

The following sections critically evaluate the three most popular forms of GT: Glaserian, Straussian and Constructivist, as well as the relationship between Ethnography and GT.

4.3.4 Glaserian Grounded Theory

Glaser’s (1978) version of GT pontificates that it is vital to start the research process with an open mind and without any preconceptions or holding a deductive hypothesis of what the end result of the research may entail. Glaser (1978) suggests that it is important for theoretical saturation to transpire as a consequence of phenomena emerging from the data gathered in the research process. The first stage of Glaserian GT involves ‘open coding’ which necessitates coding ‘in every possible way’ (Glaser 1978: 56). In Glaserian GT is essential for the researcher to create categories as a result of coding until theoretical saturation takes place. This strategy allows the data to emerge and not be ‘forced’ by the researcher (Glaser 1978). Open coding is seen as beneficial in making decisions on theoretical sampling, as it is possible to identify unexpected data as they emerge (Glaser 1978). The researcher then implements a constant comparison technique and must ask himself/herself ‘what category or property of a category, of what part of the emerging theory, does this incident indicate?’ in order for the process to be sufficiently grounded in accurate data (Glaser 1978: 57). Theoretical selective coding is then implemented to uncover the most relevant core variable by coding the data to isolate key relevant variables that might eventually become integral to the theory that subsequently emerges. As

Glaser (1978) states, theoretical selective coding attempts to 'join the dots' with substantive codes and analyses how each code is related to each other in the form of a hypothesis which can result in an emergent theory. There are two forms of codes that may emerge which are defined as 'substantive' and 'theoretical'. Substantive codes conceptualise empirical data whereas theoretical codes conceptualise in what way the substantive codes are connected as hypotheses in order to create an emergent theory (Glaser 1978). The final emergent theory should be suitable and appropriate to the area being researched (Glaser, 1978).

Although there are many benefits to be had by implementing the Glaserian approach I decided it was not the most suitable methodology to be used in my thesis, particularly due to my own philosophical underpinnings and the issues it has with complexity. In this project, the Glaserian approach would not be able to produce instant results and instead it would be necessary to wait to discover what emerges from the research after the process had started. Arguably, Glaserian GT is more Positivistic in its approach (Charmaz 2000). As discussed above, the focus of this study is on generating rich and descriptive data. Moreover, the Glaserian strategy can be regarded as overly complex and difficult to follow due to the abstract reasoning and unclear suggestions articulated by Glaser (Charmaz 2000). Thus, this form of GT was deemed to be unsuitable for my research.

4.3.5 Straussian Grounded Theory

Strauss and Corbin (1990) further broke away from the original version of GT with a heightened focus on theoretical sensitivity through the introduction of a number of new stages. The reasoning behind this theory resulted from discussions they had with students who asked for a mechanism that was better able to convert data into theory (Strauss and Corbin 1990). In order for this scenario to take place, the use of a constant comparison technique to increase theoretical sensitivity and analytical robustness is seen as a vital ingredient in enhancing the validity of the subsequent data (Strauss and Corbin 1990: 76). In addition, Strauss and Corbin (1990) and Corbin and Strauss (2008) recommend three forms of coding which they term open coding, axial coding and selective coding. They explain that open coding is utilised to understand the concepts, properties and dimensions of the data (Strauss and Corbin

1998). Axial coding is implemented to understand the link between the various data categories with 'how' and 'Wh…'[20] questions (Strauss and Corbin 1998: 127). The end consequence allows the researcher to comprehend how and why a phenomenon takes place (Strauss and Corbin 1990). Selective coding (which does not necessarily have to be the final stage) is regarded by Corbin and Strauss (2008) as particularly valuable. This is because this stage enables the researcher to identify the 'core category' where all other categories are connected to (Strauss and Corbin 1990: 116). In addition, theoretical memos are implemented in order to follow the analysis that is taking place as well as a monitoring tool for sections which may need further sampling (Corbin and Strauss 2008). In contrast to Glaserian GT, the Straussian approach advocates utilising literature to increase theoretical sensitivity and to make the research process more targeted and robust (Strauss and Corbin 1990). Furthermore, they recommend that the researcher interacts with the data in order to understand what is occurring within the research. Strauss and Corbin (1990) affirm that it is important for the researcher to be involved in this capacity as they can enhance their understanding of phenomena and use this knowledge to inform future sampling. Straussian GT is therefore an approach that concentrates on social processes through the interaction of different actors. Social processes are defined as something which are continuously evolving as participants have various interactions, which can change depending on context and individual scenarios (Strauss and Corbin 1998).

Although, as in Glaserian GT, there are several advantages to be had when implementing Straussian GT, on reflection I decided it was an unsuitable approach to implement. The rationale for this concerns a lack of clarity regarding Strauss and Corbin's epistemological approach which has been criticised by a number of scholars (such as Glaser 1992; Charmaz 2000). This version of GT has also been viewed to be Neo-Positivistic, as every researcher must follow a set of pre-ordained steps to effectively analyse the data (Newman 2008). As Strauss and Corbin (1998: 56) ascertain, it is challenging for researchers to ignore their own assumptions prior to commencing the research process and acknowledge that 'although we do not create data, we create theory out of data'.

[20] What, Why, Where, When and Who questions.

Glaser (1992) criticises this methodology for using unnecessary steps and that Strauss and Corbin (1990) are forcing the data rather than allowing it to emerge naturally. Glaser (1992) further criticises Straussian GT as researchers find it challenging not to include their own perspectives in the research process as well as the difficulty in suspending any preconceptions they have in order for the data to emerge without being influenced by the researcher in any way. There are also philosophical differences with Glaser (1992) advocating a more quantitative, critical realist approach and Strauss and Corbin (1990) more focused on qualitative methods.

Although this version is more appropriate to my research than Glaser's (1978) version and I agree with Strauss and Corbin's (1998) stance on the difficulty of researchers suspending their beliefs before commencing their research, the rigidity and lack of clarity regarding their epistemological approach influenced my decision to not implement this methodological strategy.

4.3.6 Methodological selection - the case for Constructivist Grounded Theory

This project will implement a CGT methodology where both the data and theory will be co-constructed (Bryant 2002) as a result of non-participant observation with academics and interviews with students, academics and senior management and focus groups with students and learning technologists. CGT can be regarded as ontologically relativist as it involves the acute examination of the views, values and beliefs of both the researcher and participant(s) (Mills et al. 2006a). Whereas the initial forms of GT attempted to uncover patterns of behaviour in the data and then conceptualise their properties via abstraction (Glaser and Strauss 1967; Glaser 1978; 1992) constructivist grounded theorists try to understand differences and variations in research participants and then to co-construct meanings with them (Charmaz 2006). This was a major attraction in deciding to implement CGT in this research project as I needed to identify if there was a disconnection between academics and students regarding their attitudes and interpretations of learning technologies as an effective tool in enhancing student motivation and engagement.

There are a number of similarities with each GT approach with each of them implementing 'theoretical sampling, constant comparison, coding, and memo writing'

(Nagel et al. 2015: 367). Nonetheless, there are several key differences to each strategy and there are specific reasons why CGT has been selected to use in this thesis. These are detailed below:

I concur with the philosophical arguments of Charmaz (2006) who contends that reality is perceived by people in various ways and different kinds of realities are experienced by individuals who are subjected to the same form of phenomena. For instance, it is entirely possible for students to have both positive and negative experiences with the same learning technology, which will lead to both technology acceptance and rejection. I also agree with Charmaz (2006) who articulates that it is not possible for a single truth to be measured effectively or to be wholly objective, as individuals perceive situations in different ways.

Moreover, it is argued that it is extremely difficult to interpret meanings behind a particular phenomenon. Thus, subjectivity is an unavoidable aspect of this research. My point of view correlates with CGT, which accepts subjectivity as a key part of epistemology and a number of different realities are involved in the construction of knowledge (Guba and Lincoln 1994).

Furthermore, CGT seeks to understand the various meanings that are generated by the researcher and respondent, particularly by investigating values, beliefs, ideologies, artefacts, acts and facts. Thus, CGT can be likened to Constructivist epistemology in that the research questions in this study have been constructed in order to understand in what way learning technologies are a motivating and engaging pedagogical strategy.

In contrast to classical GT, where a researcher adopts a role of a ‘distant expert’, (Charmaz 2000: 513), constructivist grounded theorists have a clear understanding of their own beliefs of a theory (Charmaz 2006). Because of this approach, researchers can be aligned to the position of ‘participant observers’ which aligns with my qualitative methods strategy (Cohen et al. 2007: 179).

I also concur with the arguments of Charmaz (2000) who states that the meanings of phenomena that are constructed by respondents in the research process are influenced by social interactions, depend on the context in which they are discussed and evolve as time goes by. This is connected to the theory of Symbolic Interactionism (Blumer 1969) elucidated above which is regarded as one of the founding pillars behind CGT (Charmaz 2014) and designed to understand relationships between humans and society. As mentioned earlier in the chapter, Symbolic Interactionism states that human action and interaction are only properly understood through the exchange of symbols or effective communication with humans representing the roles of actors (Blumer 1969). I also propose that meanings are socially constructed by the interpretations of social interactions, which have been co-constructed. This is also aligned to CGT.

Charmaz (2014: 342) thus describes the CGT process as:

> *'A contemporary version of Grounded Theory that adopts methodological strategies such as coding, memo-writing, and theoretical sampling of the original statement of the method but shifts its epistemological foundations and takes into account methodological development in qualitative inquiry occurring over the past fifty years'.*

In addition, Glaser (2006: 1) comments:

> *'Constructivist Grounded Theory celebrates first-hand knowledge of empirical worlds, takes a middle ground between postmodernism and positivism, and offers accessible methods for taking qualitative research into the 21st century. Constructivism assumes the relativism of multiple social realities, recognizes the mutual creation of knowledge by the viewer and the viewed, and aims toward interpretive understanding of subjects' meanings'.*

Glaser's (2006) assertion that CGT allows the mutual creation of knowledge was a particularly attractive aspect in deciding to use it in the thesis. For instance, the ability to co-create data with students and CUL employees on a subject I was passionate about and knew well was a unique opportunity that could not be passed upon.

Furthermore, as mentioned above, Charmaz’s (2000) interpretation of CGT is based upon the work of Glaser and Strauss (1967) and latterly Strauss and Corbin (1990) although includes greater flexibility in that researchers are able to co-construct theories with their respondents. This form of flexibility was viewed as a particularly advantageous as this project implements semi-structured interviews (see 4.4.4 below) with a number of significant stakeholders and it is vital to create a strategy that will produce detailed and rich data that can be analysed.

There are further benefits to be had when using CGT. These include the fact that it provides for an intuitive appeal, it increases creativity, it has the potential to conceptualise and it possesses a systematic approach to analysing data. It also can create deep and rich data (Hussein et al. 2014). These are all tangible benefits for a project that has not been carried out in UK Higher Education before. Furthermore, CGT is beneficial in immersing researchers in the data they are investigating (Myers 2009). This theory also provides researchers with specific guidelines that enable them to clearly carry out their studies (Charmaz 2006).

Thus, data will be constructed together with the research participants and influenced by my own previous experience with learning technologies (Mills et al. 2006a; Charmaz 2006; Charmaz 2009). It will also be possible to conduct this research over three years as CGT allows the researcher to examine data over a sustained period of time as it regards data as dynamic and changeable depending on conditions (Charmaz 2006). This was viewed as especially significant for a subject such as technology, which is constantly evolving. Moreover, this methodology can be viewed as an appropriate approach in exploring developments over a period of several years as data emerges and is not forced (Charmaz 2000).

CGT possesses a subjective epistemology and a relativist ontology that is able to create an interactive relationship between the researcher and his or her respondents throughout the research process (Mills et al. 2006b: 9). As a result, I believe the use of CGT is the most appropriate approach for this project, as reality will be co-constructed between the respondents and myself. As Charmaz (2000) states, the researcher is more of a partner to the respondents rather than analyser of experiences. This is how I see my role in the research process. The use of semi-structured interviews, focus groups and classroom observations will all be used to investigate and help accomplish these objectives (further information on these strategies can be found later in the chapter).

Therefore, the underpinning philosophy of CGT was seen as a relevant fit in aligning with my own Constructivist beliefs as well as its appropriateness in generating rich and deep data. I did not want to compromise by adopting a mixed-method pragmatic approach that may have resulted in diluted analysis. Instead, I wanted to solely focus on co-constructing rich, deep and descriptive responses that a pure qualitative strategy could best deliver.

The next section discusses and justifies the specific qualitative methods that have been implemented as a result of the research methodology discussed above. First of all, a critique of qualitative research is provided, followed by a rationale for the use of semi-structured interviews and focus groups.

4.4 The justification for qualitative research methods

Qualitative research focuses on how individuals or groups are able to observe reality and takes account of differing perspectives by understanding the real context in which the research takes place (Bryman and Bell 2015). Furthermore, qualitative research is able to study human behaviour in authentic settings and analyses experiences that cannot otherwise be measured (Saunders et al. 2011). Moreover, qualitative methods concentrate on the description and interpretation of data, which may in turn lead to the creation of a new theory or concept (Bryman and Bell 2015). Qualitative research can be regarded as flexible, emergent yet at the same time, a systematic research strategy (Bryman and Bell 2015). These benefits were all seen as useful as it was important to understand the reasons why students and academics interact with learning technologies, how their attitudes and opinions regarding their effectiveness were created and how they have been affected by their implementation in the university.

There are numerous advantages to be had by using qualitative research with arguably the most important of these being its ability to investigate a particular subject in depth, resulting in the production of deep and meaningful data (Guba and Lincoln 1994). Qualitative research is multi-method in nature as it implements a realistic and interpretive approach towards a particular subject in an environment in which it naturally takes place. Social meaning from participants in this environment is then generated (Denzin and Lincoln 1994). In addition, qualitative research possesses both a humanistic and literary focus meaning that texts usually start from and end with words. The use of words include understanding and describing values and meanings from real-life human interactions (Denzin and Lincoln 2000). Qualitative research is also valuable in answering questions on how social experiences (such as experiences with learning technologies) have been created and given meaning. As a result, these experiences are made visible and illustrated within a specific environment (Denzin and Lincoln 2000).

Nonetheless, a number of academics have articulated the various differences that exist between qualitative and quantitative research with the latter deemed to be viewed as more objective than the former (for example Neuman 2005; Punch 2013 etc.) Indeed, Corbetta (2003) maintains that the data generated by quantitative approaches is hard and objective whereas qualitative studies are soft, richer and capable of generating much deeper information than quantitative analysis. Eisner (1991: 58) additionally contends that a high quality and reliable qualitative study is beneficial to ‘understand a situation that would otherwise be enigmatic or confusing’.

In summary, qualitative research is useful in enabling a greater understanding of social issues and why things are the way they are (Saunders et al. 2011). The capability of a qualitative strategy to derive rich, deep and descriptive data was viewed as essential in this thesis.

The next section will discuss the research instrument and how the questions were formed.

4.4.1 Designing the research instrument

Specific qualitative questions were selected for the semi-structured interviews and focus groups in order to answer the research aim and research questions. For instance, for research question 1; *“To what extent do external variables have an impact on technology acceptance in students?”,* students were interviewed on particular external variables that may have an impact on their technology acceptance. These include areas such the perceived effect on academic performance, improved IT literacy and enhanced employability skills (questions 18-20 in appendix 6). Similarly, for research question 2; *“In what way do external variables have an impact on technology acceptance in academics?”*, academics were interviewed on external variables that were relevant to themselves. For example, question 11 (appendix 8) asks a question on university support and question 13 on pedagogical knowledge and ability. Research questions 3 and 4 followed the same rationale.

The interview and focus group questions were generated by the CGT process articulated by Charmaz (2006) where possessing an understanding the literature before commencing data collection is a key aspect. As Giles et al. (2013: 29) affirm, ‘mounting evidence suggests that a preliminary review can enhance theoretical sensitivity and rigor and may lead to innovative insights’. My own understanding of these issues were also helpful in designing specific questions. As Ramalho et al. (2015) pontificate, although inherently subjective, reflexivity is a key aspect in ensuring groundedness in CGT studies. These were both useful strategies in generating specific questions as well as the original contributions that I required. A detailed evaluation of reflexivity and my insider perspective is presented in 4.10.

A discussion on the piloting process is now explained followed by an analysis of the main qualitative methods employed in the study.

4.4.2 Piloting

As Polit et al. (2001: 467) elucidate, a pilot study is a ‘small scale version or trial run in preparation for a major study’. Piloting is an essential aspect of any research project in order to enhance the quality of the final inquiry (Stake 1995; Merriam 1998). In addition, Yin (2002: 79) claims that a pilot study ‘will help you to refine your data collection plans with respect to both the content of the data and the procedures to be followed’.

Piloting in this study took place with academics in 2015 in order to understand if the provisional interview questions generated sufficiently detailed and relevant data and to make amendments or changes if necessary. It was important to identify questions that produced rich and appropriate responses and to revise those which were unclear or produced irrelevant replies (Fink and Kosekoff 1985). Moreover, as Baker (1994) affirms, it is necessary for pilot studies to have a 10-20 per cent sample size of the actual respondent population in order to increase validity and for a successful outcome to occur. There were five academics involved in the pilot study, which represents approximately 14 per cent of the total number of academics at CUL. There were initially six academics who agreed to participate although one was unable to be interviewed due to illness. In addition to identifying if the interview questions were capable of generating detailed, accurate and rich responses, a further outcome was desired. It was important that the pilot interviews took place in order to hone my interviewing skills prior to the actual interviews in subsequent data collection periods.

However, it should also be stated that there are several criticisms associated with the use of pilot studies. For example, there is no guarantee that completing a pilot study will lead to overall success in the final project meaning its usage may be a waste of time and resources. Furthermore, as pilot studies tend to be small, they may not generate sufficient data to make a positive difference to the finalised research instrument. Another weakness is the potential for the pilot study to contaminate the results in the actual study. For instance, any participants engaged in the pilot study may also be used in the final study. This will mean that they have had exposure to the same questions. However, as Holloway (1997: 121) contends this issue is less of a problem in qualitative research as the data collection and subsequent analysis tends to be progressive in further interviews with the end result usually of a higher quality than in the pilot study.

The pilot study was conducted with five academics from the same department from February-March 2016 with the main intention to identify which questions were most suitable and less helpful for the actual research process. The pilot interviews demonstrated that it was necessary to reduce two questions in the introductory section, as although these questions were useful in relaxing each participant, they did not produce specific answers that were able to shed more light on the research topic (especially research questions 1 and 3). It was also necessary to expand the section on technology acceptance in academics (research question 2) as there were an insufficient number of questions in this section. As a result, the interview script was rebalanced with a smaller number of questions designed in the first icebreaker section with more specific questions created in the sections devised to gather more information on each research question. The total number of questions increased from 20 to 25 as a result of these changes.

The justification for the use of Ethnography is now provided in 4.4.3 below:

4.4.3 The case for Ethnography

Ethnography is regarded as a beneficial strategy in uncovering insider knowledge and actual goings-on (Hammersley and Atkinson 2007). Non-participant observation is a key strategy used in ethnographical research that enables the researcher to be able to better understand real life situations (Van Maanen 2011; Danzig 1985; LeCompte et al. 1993; Taylor et al. 2015).

This approach is especially advantageous in observing and identifying different forms of data that are usually not possible to access (Jorgensen 1989). There are further advantages and several disadvantages to be had regarding the use of ethnographic research, which will now be examined. First, Ethnography can be commended for its ability in allowing researchers to make judgements based on the body language of participants (Hammersley and Atkinson 2007). This was viewed as a particular advantage to identify how teachers were able to engage the class when implementing learning technologies. Moreover, it was also possible to see how students reacted. Furthermore, as Jorgensen (1989) states, researchers are able to be more open-minded when acting as an observer as they are less likely to produce subjective data and feel less sympathy. Jorgensen (1989) adds that providing the relevant participants are properly informed, overt participation can be regarded as an ethical form of research.

On the other hand, participants can act differently to normal (as in the ‘Hawthorne effect[21]’) when they know they are being observed (Wragg 2013). This issue could be problematic as the rationale for implementing this strategy was to understand the genuine behaviours and reactions of students when learning technologies were used

[21] A change in participant behaviour due to awareness in being observed.

in class. Moreover, this approach is rather onerous and time-consuming to conduct (LeCompte et al. 1993; Taylor et al. 2015).

However, on reflection it was decided that Ethnography was a valid and purposeful approach to employ due to its ability to discover deep insider knowledge and actual goings-on in the classroom (Hammersley and Atkinson 2007).

Therefore, non-participant observation via the form of teaching observations has been implemented in this study to clarify if the information gathered from the interviews with lecturers regarding their usage of technology in class is effective and accurate.

It is argued that the combination of Ethnography in the form of lesson observations and its link to GT will offer a greater understanding on the effectiveness of learning technologies in engaging students and academics in their use. As Charmaz (2014: 22) states:

> *‘Grounded Theory Ethnography gives priority to the studied phenomenon or process-rather than to a description of a setting. Thus, from the beginnings of their fieldwork, Grounded Theory ethnographers study what is happening in the setting and make a conceptual rendering of these actions’.*

Ethnography in the form of participant observation is a popular and accepted strategy that is used in conjunction with GT (Starks and Trinidad 2007; Charmaz 2008). As Charmaz (2014) discusses, Ethnography can be used in GT in order to make connections between events and to study processes: such as identifying to what extent learning technologies are used by lecturers in the classroom and to how they are able to engage and motivate students in the lesson content. Moreover, Ethnography fits well with GT’s comparative nature. This is because data can be compared from the beginning of the research and also be compared with emerging categories to highlight relationships between different concepts and categories (Charmaz 2014).

Charmaz (2014: 23) adds that Ethnography can be used in GT to develop and create theory:

> *‘Grounded Theory methods move ethnographic research toward theoretical development by raising description to abstract categories and theoretical interpretation’.*

Furthermore, the logic of GT aligns with ethnographic approaches (Charmaz 2014). For example, GT logic necessitates examining data by going back and forth until a theoretical framework is established through saturation. This logic prevents ethnographic issues from occurring such as adopting the views of respondents in an uncritical fashion, having an overly long and unfocused project, incurring a random and superficial data collection process and having an unnecessary reliance on generic categories of data (Charmaz 2014).

Therefore, Ethnography, in the form of lesson observations was decided to be a valuable strategy to adopt in order to witness the acceptance of learning technologies from a student and academic perspective at first hand. It was decided that it was important to record the observations so that potentially vital information was not excluded correlating to the recommendations of Balakrishnan and Gan (2013: 634). This was accomplished through the use of the university’s ‘Echo360’ software[22]. An actual observation form from this process can be found in Appendix 11.

The rationale for implementing semi-structured interviews is now discussed below.

4.4.4 Semi-structured interviews

Semi-structured interviews are argued as the most relevant strategy for this project in which to discover the most appropriate data due to the fact that they are beneficial in facilitating two-way communication between the interviewer and participant. Unlike structured or unstructured interviews, they allow the interviewer the opportunity to

[22] Video recording software popularly used in UK HE.

ask further questions based on an initial response (Rabionet 2011). This personalised approach permits the interviewer to ask specific questions when necessary and probe the experiences of the interviewee in order to understand a particular situation in greater context (Rabionet 2011). As I am interviewing three different stakeholders using this approach: students, academics and senior managers; semi-structured interviews were seen as useful in discovering each particular viewpoint from three sets of very different interviewees. Thirty-five interviews were conducted in total (20 with students, 10 with academics and 5 with senior managers). As Warren (2002) maintains, a minimum of 20-30 interviews should be conducted in a qualitative study in order to make the findings valid, robust and reliable.

Although semi-structured interviews are acknowledged as occasionally challenging to conduct, they are valuable in discussing more sensitive topics once trust has been established between the interviewer and interviewee (Bryman and Bell 2015). They are also useful in identifying non-verbal indicators such as attitudes to a topic and in evaluating truthfulness through facial expressions, responses and body language (Bryman and Bell 2015). Another benefit is that semi-structured interviews allow respondents to be interviewed individually, meaning their answers cannot be altered by anyone else (Rabionet 2011). A further advantage concerns the fact that they are able to potentially increase the response rate. This is on the proviso that the interviewer possesses a sufficiently sophisticated and professional interviewing technique and has built up a rapport with the respondent (Rabionet 2011). Furthermore, the usage and implementation of a standardised question script provides greater uniformity and structure to the whole interview process (Saunders et al. 2011).

Although as mentioned above, there are a number of strengths to be had when utilising semi-structured interviews, there are also weaknesses associated to employing such an approach. First, they can be criticised for their potential invasion of privacy if the interviewer focuses on an overly sensitive topic in the interview (Bryman and Bell 2015). Secondly, they have also been criticised for not properly representing particular groups who are either not invited or who are unwilling to attend an interview. This scenario may lead to biased and unrepresentative results (Bryman and Bell 2015). The role of the interviewer can also distort findings, as there may be either conscious or unconscious bias that is visible in the actual interview. Furthermore, semi-structured interviews are viewed by many scholars as rather expensive and time-consuming to conduct (Rabionet 2011). It is also vital that the interviewer possesses the requisite interview skills to create an atmosphere that is sufficiently conducive for efficient two-way communication to occur. If the interviewer is inexperienced or lacking in these skills, the quality of the interview results may be substandard and ultimately not fit for purpose (Neuman 2005). The recording of interviews for transcription purposes may inhibit the responses of interviewees and the location, the tone of the interviewer and wording of questions may also result in distorted answers from interviewees (Neuman 2005). However, due to my past interviewing experience and use of pilot interviews in this project, no issues were evident.

The justification for the use of focus groups will now be examined below.

4.4.5 Focus groups

Focus groups were utilised as an additional integral aspect of the research project in order to gather data from different student cohorts throughout each of the data collection periods. A focus group with learning technologists was additionally conducted in order to understand their unique perspectives of both student and academic acceptance of learning technologies. Although focus groups are argued as a mainly advantageous tool, there are nevertheless both pros and cons as will be examined below.

There are several benefits regarding the use of focus groups which will now be discussed. First, the moderator in charge of the focus group is able to stimulate the discussion and keep the conversation on track in order to create data that is more appropriate (Gibbs 1997). Fortunately, I was able to accomplish this objective in each of the three focus groups (two with students and one with learning technologists) that took place. Furthermore, it is contended that focus groups possess the ability to generate new ways of thinking due to participants sharing knowledge with each other. It is also asserted that focus groups are helpful in identifying non-verbal behaviours that techniques such as questionnaires are unable to accomplish. For example, focus groups afford the researcher the opportunity to understand the attitudes, expressions and to what extent participants are engaged in a particular topic. These observations can then be added to the research output (Gibbs 1997). Additionally, the facilitator of the focus group possesses the capability to ensure all participants contribute equally and can prompt for further contributions if necessary. Another advantage is the potential for negotiated realities as meaning is derived through discussion with fellow participants (Gibbs 1997). Finally, focus groups can be articulated as useful in allowing researchers the ability to screen each member before a session starts. This is important in making sure the most appropriate members are involved in the discussion (Gibbs 1997).

Although focus groups are contended as an appropriate inherent strategy in which to gather relevant data for the project, there are still several weaknesses associated with their use, which will now be detailed. First, it is maintained that focus groups sometimes have the tendency to be dominated by one or two participants, which can lead to a lack of balanced output. Secondly, they are criticised for their inability to deal with sensitive topics, as some participants may be reluctant to discuss these subjects in front of other people. Thirdly, although focus groups are able to generate rich and descriptive data, they are unable to replicate the same amount of objective data that is possible via quantitative methods (Gibbs 1997). Focus groups are also criticised due to participants behaving differently when they are being overtly observed. For example, some respondents may attempt to impress the researcher or the other participants with incorrect or exaggerated comments (Ritchie et al. 2013). There is also a danger of “group think” occurring where participants agree with others in order to preserve their reputation or the status quo when they actually possess different opinions to those they project in public (Janis 1989). In this study, it should also be acknowledged that there was a disparity in consistency between the two student focus groups. It was intended that both focus groups would have four participants, although one student dropped out on the day of the 2017 focus group meaning there was a lack of consistency in terms of the numbers of students involved in the focus group strategy. Unfortunately, this was not possible to avoid as the student withdrew at the very last minute.

The data collection process and subsequent analysis will now be detailed and justified in 4.5 below.

4.5 Data collection and analysis

Yin (2002: 109) proposes that analysis ‘consists of examining, categorising, tabulating, testing, or otherwise recombining both quantitative and qualitative evidence to address the initial propositions of a study’. Moreover, Stake (1995: 71) provides his own definition when stating that analysis is ‘a matter of giving meaning to first impressions as well as to final compilations’.

Qualitative researchers, such as myself, must carry out the data collection and analysis procedure simultaneously. This means there is no specific timeframe to begin the analysis process, as this occurs at the same time (Stake 1995).

Stake (1995) proffers that there are two main strategies in which to analyse data, which he names ‘Categorical Aggregation’ and ‘Direct Interpretation’. Stake (1995: 77) affirms that although these strategies are commonly used when analysing data from case studies, nevertheless ‘each researcher needs, through experience and reflection, to find the forms of analysis that work for him or her’. I followed this advice in my data collection and analysis process when choosing to use NVivo software. The justification for using this strategy will be discussed in 4.7.

Mason (2002) argues that there are three potential approaches to qualitative data analysis. These are described as “literal”, “interpretive” and “reflexive”. “Literal” is articulated as a process that analyses specific language or syntax. “Interpretive” is designed to understand the meaning behind what a participant comments on and “reflexive” is elucidated as analysing what the researcher says and how and what they have contributed to the data analysis process. Whatever approach the researcher decides to adopt, they must use either manual or computer-assisted methods (such as NVivo as mentioned above) to analyse the data they collect.

The data gathered in this thesis was analysed inductively and based on the recommendations of Creswell (2002) and Charmaz (2014) in five distinct stages. First, an initial reading of the interview and focus group transcripts took take place in order to identify specific and relevant data provided by respondents (Charmaz 2014). Then, the initial codes were labelled in order to create specific categories or themes (30-40). The categories were then significantly reduced to between 15-20 themes. Finally, a theoretical framework was created that incorporated the most appropriate themes and reduced again in number to six categories. The results of this strategy can be seen for students in Chapter Five and for academics in Chapter Six.

The inductive strategy that was employed was seen as particularly beneficial due to inductive approaches focusing on the generation of new theory that emerges from data (Gabriel 2013). A deductive strategy was excluded, as there was less emphasis on causality with no hypothesis involved. Moreover, this research is qualitative, not quantitative and more concerned with the exploration of new phenomena in order to create a new theory (Gabriel 2013). The inductive approach is also most suited to the use of GT which was discussed and justified above.

It is important that data from exploratory studies such as this are collected from at least two different sources, to arguably create a form of triangulation (Stake 1995). Yin (2002) concurs when articulating that there are six types of evidence that can be used by researchers in order to increase the validity of the data collection. These are documentation, archival records, observations, participant observation, interviews and physical artefacts. Yin (2002) claims that each of these sources possess their own advantages and disadvantages and represent the most popular forms of evidence although there are number of other sources that could also be utilised.

Yin (2002) states that there are several general rules that accompany these six tools as well as the overall data collection procedure. These rules include integrating at least two forms of evidence as mentioned above and the creation of a case study database which is seen as beneficial in helping new researchers understand and effectively categorise data. Furthermore, it is important to have evidence that is clearly linked with the research questions, the data that is collected and subsequent conclusions in order to 'follow the derivation of any evidence, ranging from initial research questions to ultimate case study conclusions' (Yin 2002: 83).

These rules are vital in increasing the validity of the data collection process and will enhance the quality of the data that is gathered (Yin 2002). Additionally, Stake (1995: 51) states that a robust and valid data gathering process must include a 'definition of a case list of research questions, identification of helpers, data sources, allocation of time, expenses, intended reporting'.

Like Stake (1995), I am a particular proponent of the use of interviews, participant observation and document review in qualitative research data collection. I agree that it is vital for the excerpts from qualitative interviews to be effectively transcribed with interviews conducted thoroughly and professionally (Merriam 1998). For instance, it is important to pose relevant questions, avoid irrelevant or awkward questions, probe appropriately, follow a clear interview structure, develop a rapport with the interviewee and record and evaluate the data after the interview (Merriam 1998).

Using the recommendations above, this research incorporated interviews with academics to ascertain how they differ in their attitudes to the perceived effectiveness and adoption of learning technologies (see appendix 8 for the interview questions with academics). Interviews also took place with students to analyse influences on technology acceptance (see appendix 6 for the student interview questions). Focus groups were arranged to understand what specific interactive learning technologies motivate students to engage with their subject and to what extent nationality is pervasive when engaging students through this medium (see appendix 7). A focus group was also arranged with learning technologists (see appendix 9) and interviews with senior management (see appendix 10). Great care was taken to ensure each part of the research process was accurately transcribed and conducted ethically.

4.6 Ethical considerations

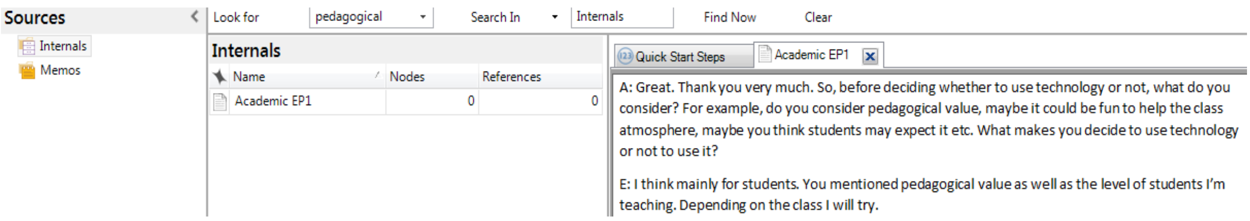
Ethical considerations have been adhered to from the very start of the thesis. In Year 1, the academics who participated in the pilot interviews were informed explicitly that they were free to terminate the interview at any stage without offering an explanation and their identities (which were coded) would remain confidential at all times. Each subsequent data collection period followed a comprehensive and rigid ethics process (see appendices 1-5 for the documentation). The data that was collected for the pilot interviews, actual interviews and focus groups was stored on an encrypted memory drive and kept in a locked drawer in a locked office that only I had access to. The risk to both academics and students was regarded as minimal as the themes explored in the interviews and focus groups were designed to be developmental and without potential controversy (Saunders et al. 2011). The risk assessment form, participation information sheet, informed consent form and gatekeeper letter can be found in appendices 12-15 respectively.

The coding process using NVivo software is articulated and justified in the next section.

4.7 Coding – NVivo

NVivo was used in this research project to analyse the data themes from the qualitative responses. Bazeley and Jackson (2013: 2) affirm that NVivo's capability in 'recording, sorting, matching and linking' make it a valuable form of software to conduct qualitative analysis. An example of the NVivo coding process can be found in Figure 24 below:

Figure 24: NVivo screenshot



NVivo is one of the most commonly used forms of software utilised in qualitative research analysis (Welsh 2002). However, researchers must decide on whether to use manual methods and/or software such as NVivo with advantages and disadvantages associated with both strategies (Welsh 2002).

4.7.1 Benefits of NVivo qualitative analysis

NVivo is a valuable tool in providing an efficient and transparent way of analysing data (Welsh 2002). As Morrison and Moir (1998) contend, this particular benefit is able to provide greater reliability and more understanding of the data. Furthermore, as Welsh (2002) argues, qualitative data software is popularly considered to be embedded in GT, as theory will emerge from the data that is generated. It is important that NVivo possesses functions that are able to replicate theory building from the data that is produced. Moreover, as Welsh (2002: 5) elucidates, adopting a

GT approach when conducting data analysis will allow the data to ‘speak for themselves rather than approaching the data within’. NVivo was therefore decided to be a good fit for the CGT approach.

Furthermore, Ozkan (2004: 589) contends that NVivo is a particularly useful form of software in the studying of ‘authentic and constructivist learning and teaching in the classroom’. This is due to its efficiency in conceptualising and coding large amounts of data. Again, NVivo was seen to align well with my Constructivist beliefs. In addition, Bazeley and Jackson (2013: 3) claim that NVivo is specifically able to enhance the quality of qualitative analysis of five different areas; managing data, managing ideas, querying data, visualising data and retrieving reports from the data. Further details of these advantages can be found in Figure 25 below:

Figure 25: Five benefits of NVivo analysis

Managing data	NVivo is helpful in organising and helping to keep track of qualitative data. Data can be effectively organised from qualitative methods such as interviews, focus groups, observations, questionnaires and videos.
Managing ideas	NVivo is useful in providing efficient access to conceptual and theoretical knowledge, which has been generated in a study.
Querying data	The software has the capacity to ask straightforward or complex questions of the data that has been gathered.
Visualising data	NVivo is also able to display the content and structure of concepts, sampling strategies and ideas and then provide a visual display of the relationships between this data.
Reporting from the data	Finally, NVivo is able to generate a report from the data that has been collected.

Source: Bazeley and Jackson (2013)

4.7.2 Disadvantages of NVivo qualitative analysis

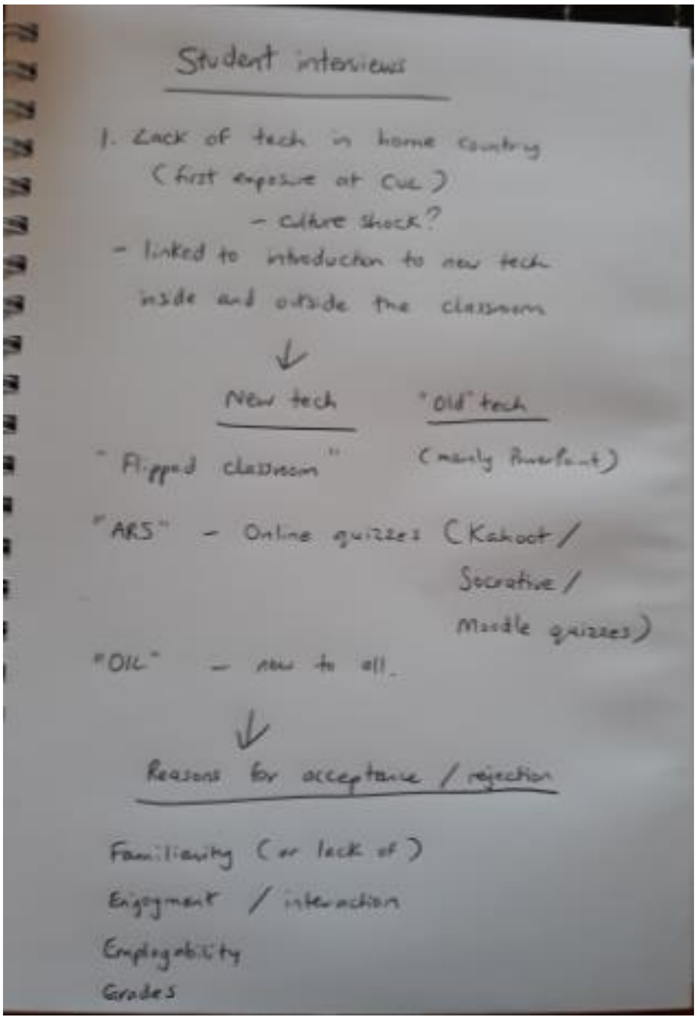
Although NVivo is argued as the most appropriate tool to conduct data analysis due to the advantages articulated above, there are still several limitations, which will now be examined.

First, it has been suggested that the use of software such as NVivo may guide researchers in a particular direction and could reduce objectivity in the research process (Seidel 1991). Furthermore, it has been noted that computer-assisted software may create distance between the researcher and the data and lead to quantitative analysis of qualitative data (Barry 1998). This scenario may result in homogeneity of research methods (Barry 1998). Finally, Kelle (1997: 20) claims many researchers have jumped on the GT ‘bandwagon’ as it is an ‘established brand name’. Kelle (1997: 20) believes that NVivo is not actually aligned to GT but is instead a ‘coding paradigm’ and is a combination of inductive and deductive methods. Furthermore, although NVivo possesses functions that mimic GT and encourages the researcher to derive theory from the data, researchers do not always explicitly follow GT guidelines when the software is used (Kelle 1997). Despite these criticisms, it was decided there were far more advantages in using NVivo; particularly due to it being useful in studying ‘authentic and constructivist learning and teaching in the classroom’ (Ozkan 2004: 589).

4.8 Memo writing

Memo writing was employed as part of the CGT strategy and was a central part in creating the conceptual framework. This procedure took place at the same time as the NVivo coding process articulated above and when analysing the data. An example of my memo writing can be found in Figure 26 on the next page:

Figure 26: Example of memo writing



As Charmaz (2006) argues, this overall process is particularly beneficial in identifying the theoretical codes and categories which emerge from the data that is collected. As will shortly be displayed in Chapter 5, there were 23 initial categories discovered as a result of the interviews with students and 12 from the interviews with academics. Eight categories were discovered from the focus groups with students and mirrored the same themes that emanated from the student interviews. As there were 10 students, (20 in total with 23 categories emerging) interviewed in each data collection period and five academics (10 in total with 12 categories emerging) during the same timeframe, there is arguably a form of congruence in the number of initial categories. Chapter Seven displays the conceptual framework (SATAM) where six of these categories were created as a result of theoretical saturation for both students and academics.

The sampling strategies that were employed will now be examined in the next section.

4.9 Theoretical sampling (interviews and focus groups)

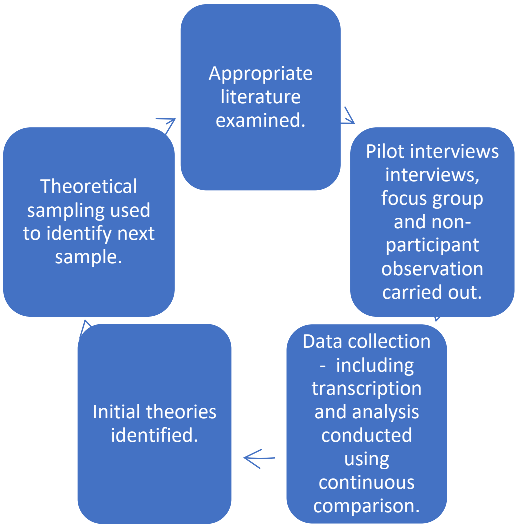
Theoretical sampling was the natural choice for this research project due to its central role in the CGT process. As Strauss and Corbin (1990: 176) state, this involves ‘sampling on the basis of concepts that have proven theoretical relevance to the evolving theory’. Theoretical sampling involves the process of collecting data in order to generate theory where the researcher gathers codes and analyses data (Glaser 1992). The researcher then decides what specific data to subsequently collect so as to continuously develop a theory as it appears or emerges (Glaser 1992). Theoretical saturation occurs after theoretical sampling has taken place.

The initial stage of theoretical sampling depends on the researcher’s perspective of the topic under investigation, which should not be based on any preconceived research or theory (Glaser and Strauss 1967). The researcher then isolates key areas that will be researched. This can be regarded as the foundation stage of the research (Glaser and Strauss 1967). Glaser and Strauss (1967) add that scholars must possess the ability to conceptualise and create theories, which appear from the data that is collected. Moreover, Glaser and Strauss (1967) posit that researchers must not limit themselves to a particular aspect of a theory and instead be open for all eventualities that may emerge. Finally, they claim that one of the most important considerations is identifying what specific groups the researcher subsequently uses in the next stage of the data collection process and the rationale for doing so.

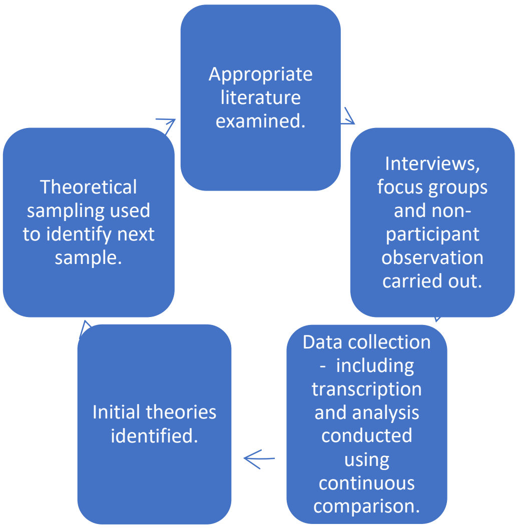
Each stage of the theoretical sampling process employed in this thesis can be seen in Figure 27 on the next two pages:

Figure 27: Theoretical sampling process

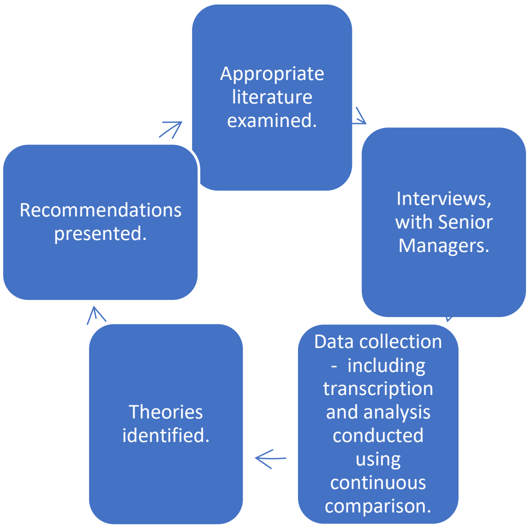
Year 1:



Year 2:



Year 3:



Throughout the research process, it was possible to substitute different academics and students. This situation was unavoidable due to staff attrition and students leaving the university after their courses had ended. As Bowen (2008: 141) states 'it is not necessary to interview the same participants repeatedly if there are other sources of data. Sampling adequacy, then, is evidenced by saturation and replication'. As Morse et al. (2002: 12) state, this means that 'sufficient data to account for all aspects of the phenomenon have been obtained'.

Other forms of sampling such as random, snowball and convenience sampling were considered but not implemented. Random sampling would have increased the level of validity and reliability although with such a small population to choose from it was concluded that this strategy would not be worthwhile. As theoretical sampling is an integral component of the GT process (Glaser 1992) it was decided that this was the most appropriate strategy to pursue, particularly as I wanted to create a new theory on technology acceptance in students and academics. Moreover, it is argued that theoretical sampling will be able to provide greater rigour through continuous comparisons of the data in order to produce a suitably robust conceptual framework. Although generalisability and representativeness are both naturally important, I am also focused on the quality and adequacy of the sampling (Bowen 2008). By utilising this strategy, I will focus on including the most appropriate participants (students and academics) who best represent the research topic. On the other hand, it is acknowledged that this approach may not be as effective in reducing unconscious and conscious biases in the selection process when compared to probability sampling.

Nonetheless, there are several further advantages and justifications for using this method, which will now be examined. The greatest advantage in employing theoretical sampling is its ability to generate a higher level of rigour and create theory in the area of investigation (Coyne 1997). It is also opined that theoretical sampling can add more structure to the research and data analysis process (Coyne 1997). Moreover, as Glaser and Strauss (1967) state, it is a very flexible form of sampling as the researcher is able to adapt their strategy when conducting research at an early stage in order to collect specific data that is wholly relevant to the subject being studied. This was seen as another advantage in achieving data saturation.

Although it has been criticised for being vague and unsystematic (Bowen 2008), data saturation is a useful technique in gathering data until nothing unique has been discovered (Bowen 2008; Strauss and Corbin 1990). Indeed, it is contended that saturation is a vital aspect of naturalistic inquiry (Glaser and Strauss 1967). At this juncture, data categories are created and validated (Bowen 2008). Indeed, Glaser and Strauss (1967: 65) state ‘when one category is saturated, nothing remains but to go on to new groups for data on other categories, and attempt to saturate these categories’. The saturation of all categories then signifies the end of the research (Bowen 2008).

Although there are several advantages to be had in using theoretical sampling as detailed above, there are nevertheless some weaknesses, which will now be discussed. First, it is seen as a rather complicated form of sampling which may be difficult to understand and effectively implement, particularly by inexperienced researchers (Coyne 1997). Moreover, theoretical sampling is a very time-consuming, onerous and often expensive method due to its systematic nature (Coyne 1997).

Nonetheless, on balance it was decided that there are far more advantages than disadvantages with this form of sampling and it was concluded it was the most appropriate strategy to apply in the research project.

4.9.1 Event sampling (Lesson observations)

Event sampling was employed in the lesson observations to ascertain how often academics used technology in their classes. The frequency of use was deemed to be important in validating if academics utilised learning technologies to the same extent that was elucidated in the interviews. This approach is helpful in identifying specific occurrences and in preserving the integrity of the observation being conducted. On the other hand, it can be considered as a challenging strategy to employ in recording data if there are too many events taking place at the same time (Grebner et al. 2004). As it was highly unlikely that technology would be continuously introduced throughout a lesson it was not anticipated that this issue would prove to be problematic.

4.10 Reflexivity and insider research

Reflexivity was a key concern throughout this research. As McNiff et al. (2003) maintain, participatory action research is value-laden and the researcher must be aware of how they respond in relation to these values. For example, Mercer (2007) asserts that it is important for researchers to view respondents personally and not universally. In this study, great care was taken to treat participants professionally and as individuals as elucidated by Paley and Lilford (2011) although the “power” I possessed with both students and academics may have led to the possibility of respondents giving me answers they perceived that I wanted to hear (Mercer 2007). This issue was mitigated somewhat by respondents being contacted by email by a third party (the senior academic administrator) and asked to participate voluntarily. To further alleviate my preconceptions, I made an effort to make notes of my reflexive interactions after each interview so I was able to identify my own subjectivity and analyse my own thought processes as recommended by Conneeley (2002). I then reflected on these interactions prior to each subsequent interview and focus group in order to re-focus and regulate my own contributions.

On the other hand, there are several benefits to be had from reflexivity (Berger 2015). As Ramalho et al. (2015) maintain, reflexivity is a key aspect of ensuring groundedness in CGT. Further advantages include when the researcher is able to share the experience of the research participants as well as when the researcher moves from a position of outsider to insider to glean more personal information. In my role, I was already in the position of an insider although the research process allowed me to make closer contact with students and academics through the methods that were employed. Insider research in this example can be regarded as a situation where the researcher has a direct link to the environment that is being investigated (Robson 2011). Insider research is an appropriate fit for the Constructivist paradigm due to it being immersed in multiple realities and can clearly be associated with the role of the researcher in constructing a specific reality (Lincoln and Guba 1985).

Overall, in my own unique situation, the role of insider offered a number of key advantages to the research process. First, an insider such as myself, possesses knowledge of the university that any outsider is not able to have. As Mercer (2007) elucidates, researchers with insider knowledge have an understanding of the micro, meso and macro aspects of their organisation. Costley (2010) adds insider researchers are also able to leverage support from their organisations in order to gain greater access into a particular issue. One of the intentions of the research is to enhance the working environment for academics and the learning environment for students. This was a persuasive factor in getting a suitable number of participants on board. Furthermore, it is contended that insider researchers tend to have greater credibility with their research subjects due to having greater familiarity with them. Perryman (2011) and Breen (2007) assert that this scenario is able to create deeper and more authentic data as well as greater trust.

Insider research is therefore a vital component of this research and inherently connected to my background as an academic attempting to enhance the student experience. As Kanpol (1997: 13) states:

> *‘Self-reflexivity is indubitably connected to one's personal history. One's history is tied into the research site on some conscious or unconscious level’.*

The final section of Chapter Four examines the validity, reliability and generalisability of the methods that were employed.

4.11 Validity, reliability and generalisability

As in many qualitative approaches, it is argued that there may be an issue in creating generalisability. However, it is contended that there are a sufficient number of student respondents (twenty in total, encompassing different nationalities as well as ten academics, four learning technologists and five senior managers).

The lesson observation strategy is also seen as particularly useful in enhancing the validity of the data. Although arguably a snapshot and not representative of a holistic pedagogical approach, lesson observations are useful in clarifying if academics actually use technology to the extent that they state in the interviews and to observe its effects on student engagement at first-hand. It was also deemed a useful strategy to clarify if academics kept up-to-date and embedded current learning technologies in their classes (rather than relying on the same techniques). This was seen as important to reflect on the evolving, ephemeral nature of technology.

As Stenbacka (2001) proffers, the concept of generalisability is desired after validity and reliability have been accomplished. Generalisability is a major criterion for success in qualitative studies (Patton 2002). It can be asserted that the implementation of more than one method (interviews, focus groups and lesson observations) increased the validity and reliability of the research process leading to more likelihood of generalisability taking place. Thus, it is argued that the Constructivist nature of this study will be able to create sufficiently valid and reliable data that will help to answer both the research aim and research questions on what specific learning technologies encourage technology acceptance in higher education students and academics.

It should be acknowledged that the use of validity and reliability is rooted in the positivistic perspective although recently they have both received greater use in qualitative research (Golafshani 2003). Consideration was taken to achieve construct, internal and external validity, as they are vital in ascertaining the quality of any research project (Yin 2002). Therefore, I enhanced construct validity by assessing different types of evidence, checking the relevance of participants and chains of evidence, internal validity by employing commonly utilised analysis techniques (by using NVivo software), external validity (in terms of analytic generalisation) and finally reliability (by checking and re-checking the data I collected and analysed which led to theoretical saturation).

Furthermore, Stake's Constructivist epistemological approach (1995: 108) affirms that 'most qualitative researchers not only believe that there are multiple perspectives or views of the case that need to be represented, but that there is no way to establish, beyond contention, the best view'. Therefore, it is vital for qualitative researchers to adopt appropriate ethical standards throughout the research process in order to reduce misunderstanding and misinterpretation of data (Stake 1995: 109). As a result, researchers must use appropriate protocols and processes to increase the validity of the data that is generated (Stake 1995: 109). In addition to adopting these protocols and participating in member checking, Stake (1995: 112) asserts that researchers need to 'gain the needed confirmation, to increase credence in the interpretation, to demonstrate commonality of an assertion'. With specific reference to qualitative research, Merriam (1998: 199) states that 'the qualitative study provides the reader with a depiction in enough detail to show that the author's conclusion makes sense'.

This thesis has employed a suite of selected qualitative methods as explained and justified above. This strategy has enabled the research process to increase credence, reliability and validity as discussed by Stake (1995). Although it is acknowledged that the qualitative approach has a number of limitations, particularly with regards to subjectivity, it is argued that it is the most appropriate method to apply due to its ability in generating deep, descriptive and rich responses.

4.12 Chapter Four summary

This chapter has provided a rationale for the selection of qualitative methods and CGT, vindicating the link as the most appropriate methodology to be used in this thesis due to the capability to explore human experiences, generate theory and align with my own Constructivist philosophical beliefs. It was maintained that this research seeks to uncover rich and descriptive responses to better understand the relationship involving students, teachers and technology. The process of eliminating other methodological considerations was also detailed and justified. Qualitative methods were critically appraised and evaluated. The data collection process was elucidated and issues surrounding sampling, ethical considerations, validity, reliability, generalisability and reflexivity were all discussed and examined.

Chapter Five will now present the results from students, which emanated from the research strategies discussed and analysed in this chapter.

Chapter Five – Student Findings

5.0 Introduction to Chapter Five

Chapter Five presents the student perspective derived from the interviews and focus groups. As discussed in the introduction, the purpose of this study is to identify how to improve teaching effectiveness and the student learning experience by understanding how and why learning technologies are accepted and which technologies particularly facilitate acceptance at Coventry University London. As will be discussed, the analysis indicates there are several different external variables, which affect technology acceptance in students.

The CGT strategy initially identified 23 themes over the first research collection period with students. As can be seen in Table 6 below, these were:

Table 6: Initial themes (Student interviews)

1. Lack of technology in home country
2. Introduction to new technology in the UK
3. The popularity and unpopularity of the flipped classroom
4. Popularity of ARS
5. Use of mobile phones
6. Technology to maintain interest
7. Technology to increase student satisfaction
8. Videos to engage
9. Creating own technology (rather than being a recipient)
10. Advice for teachers from students
11. Moodle pros and cons
12. Moodle discussion forum – lack of proactivity, reliance on teacher
13. Pros/cons of Turnitin
14. Importance of balancing technology use
15. Enhancement of student experience/performance
16. Learning technologies enhancing IT proficiency

17. Learning technologies improving employability 18. Nationality as an inhibitor to technology engagement 19. Technology acceptance through hedonism 20. Expectations of technology 21. Most engaging learning technology 22. Popularity/Familiarity of PowerPoint 23. Online International Learning (OIL)

In addition, as can be seen in Table 7, there were eight initial themes identified from the first student focus group:

Table 7: Initial themes (First student focus group)

1. Popularity of gamification 2. Popularity of videos 3. Introduction to new learning technologies at CUL 4. Negative external variables affecting student performance 5. Impact of nationality on technology acceptance 6. Perceived teacher ability utilising technology 7. Advice for lecturers 8. Future benefits

These results emanate from 2016-2017, from both the interviews and focus groups with students.

In terms of coding, letters and numbers are used to illustrate the respondent and the period of data collection. For instance, Student AP**1** is from data collection period **1 (2016)**, Student AP**2** is from data collection period **2 (2017)**. Moreover, Student AP**1FG** signifies a **focus group** respondent from data collection period **1 (2016).**

The demographics of the respondents in each period of the project can be found in Tables 8-11 on the next two pages:

Table 8: 2016 (Student interviews)

Name	Nationality	Gender
Student AP1	Pakistan	Female
Student BP1	Oman	Female
Student CP1	China	Male
Student DP1	Vietnam	Female
Student EP1	India	Female
Student FP1	India	Male
Student GP1	Egypt	Male
Student HP1	Pakistan	Male
Student IP1	Spain	Female
Student JP1	Canada	Female

Table 9: 2016 (Student focus group)

Name	Nationality	Gender
Student AP1FG	Pakistan	Female
Student BP1FG	India	Female
Student CP1FG	Egypt	Male
Student DP1FG	India	Male

Table 10: 2017 (Student interviews)

Name	Nationality	Gender
Student AP2	Indian	Male
Student BP2	Chinese	Female
Student CP2	Colombian	Male
Student DP2	Saudi Arabian	Male
Student EP2	Chinese	Female
Student FP2	Chinese	Female
Student GP2	Indian	Female
Student HP2	Taiwanese	Male
Student IP2	Chinese	Female
Student JP2	Japanese	Female

Table 11: 2017 (Student focus group)

Name	Nationality	Gender
Student AP2FG	Japanese	Female
Student BP2FG	Taiwanese	Male
Student CP2FG	Chinese	Female

5.1 Students – External variables affecting technology acceptance

The 23 initial external variables that were identified in Table 6 were amalgamated with the 8 variables from the student focus group in Table 7. These were then reduced to 12 themes after constantly comparing the data. These themes were redesigned as:

1. Technologies that improve student grades.
2. The link between technology acceptance and student progression.
3. The importance of technology for a future career.
4. How technology can be replicated outside of class.

5. Particular technologies that are useful outside of class.
6. Technologies that can make studying easier.
7. Classes that use technology that are fun to attend.
8. Lecturers that use technology to improve the classroom atmosphere.
9. Certain nationalities are good/confident using technology.
10. Certain nationalities struggle with technology.
11. Positive past experience.
12. Negative past experience.

These resultant 12 themes then underwent the same exhaustive process with six major variables ultimately discovered in students as result of coding each response using NVivo and subsequent theoretical saturation. These included the perceived effect on academic performance (developed from points 1 and 2 above), relevance of technology to their future career (developed from 3 and 4), enhancement of IT literacy (from 5 and 6), enjoyment using technology (from 7 and 8), the nationality of the student (from 9 and 10) and how familiar students were with the technology before they used it (from 11 and 12).
These results are now discussed and structured in terms of a hierarchy: the richest, deepest, most descriptive and consistent responses are presented first followed by less impactful responses. Perceived effect on academic performance is examined first.

5.1.1 Perceived effect on academic performance

It was discovered that the perceived effect on academic importance had a significant influence for students when accepting new technologies. This variable can be divided into three areas – enhanced student experience and convenience of use (both leading to better academic performance) as well as the direct positive perceived impact on grades. It should be acknowledged that overall this variable is more connected to PU than PEOU although the second associated sub-variable in 5.1.1.2 (convenience of use) is more closely associated to PEOU. This division is reflected in the conceptual framework presented in Chapter Seven.

The link with enhanced student experience is discussed next.

5.1.1.1 Enhanced student experience

The influence of technology enhancing the student experience was elucidated by seven out of the ten students interviewed in 2016 as well as consistently throughout the 2016 focus group. For instance, Student AP1 claimed that the use of learning technologies in the classroom was able to improve her concentration and engagement with a topic. Likewise, Student FP1 stated that there was a huge difference in terms of the positive experience he enjoyed at CUL when compared to the previous UK HEI where he studied at previously. The interactive nature of technology was viewed as a positive by every student interviewed in the first data collection period in 2016. On the other hand, Student JP1 was critical in that there was a perceived imbalance in terms of the experience that was offered, due to certain academics being more proficient in using learning technologies when compared to others. In the 2016 focus group there was unanimous agreement that the use of simulations were beneficial in enhancing the student experience and ultimate academic performance due to their impact in increasing communication between group members. Embedding videos was seen as a useful strategy to reduce boredom and increase interest. The 2016 focus group also discovered that there was a perception from students that an academic's age played a role in how confident they were in accepting and using technologies with younger academics viewed as more motivated, able and keen to experiment.

Data from the 2017 student interviews demonstrated that there was broad agreement with the comments made in 2016. These students viewed the use of learning technologies in a module to be conducive in improving the student experience. For example, Student AP2 stated that he was initially not used to using technology in classes due to not having any prior experience in India although he soon became to realise it was necessary to use technology as it made his *'life easier'* (line 41: 283). A similar comment was also made by Student CP2 who stated the only technology he had been exposed to before joining CUL was PowerPoint when he was an undergraduate student in Colombia. Student JP2 was a mature student who had not studied in a university for over 20 years. She commented that she was surprised by the amount of technology that was used at CUL, although found the experience enjoyable due to the quality of interaction that subsequently took place.

Student CP2 stated that the use of learning technologies in class was motivational as the interactivity they offered enabled him to engage more deeply in subjects. Furthermore, Student DP2 elucidated that he enjoyed ARS (especially ‘Socrative’ and ‘Kahoot’) as they were both fun to play and helped him to retain knowledge. Student DP2 mentioned that the use of ARS was particularly effective in improving his experience on the course. Furthermore, Student EP2 observed her experience at CUL was *‘totally different’* (line 7: 356) from her previous university in China. Student EP2 said she much preferred the interactive teaching environment at CUL (particularly when ARS were used) in comparison to her previous education, which she described as traditional one-way instruction where the teacher mainly lectured to students. Interestingly, despite studying for an undergraduate degree at a different university in London, Student IP2 was surprised by the amount of technology she was exposed to at CUL. This was seen to be a positive development. The latter comment was also made by Student FP2. Student EP2 found videos engaging and useful in learning about a subject. On the other hand, it was evident that there was a disparity in the academic approach to using technology in both lectures and seminars. For example, Student GP2 claimed that some modules had no technology embedded at all and were more focused on one-way delivery. In addition, Student GP2 commented that certain academics were more confident and proficient than others. Similar comments were made by the other students in the 2017 interviews (especially from Student JP2), indicating that there had been no change in the technologies delivered by academics since the previous year.

The hedonistic angle was again prevalent in 2017. For instance, Student HP2 stated:

> *‘It’s really good. It’s quite interesting because I think in the past before I came here, because I’m from Taiwan, Taiwanese teaching style is quite boring, just like, how to say, just open a book, just read a book and then nothing. But, in Coventry University, some of our tutors they use like a quiz or some role-play, some game, show some videos. I think it’s quite make the seminars quite fun’.* (lines 31-41: 421).

Moreover, Student IP2 cautioned that it was important for a suitable number of technologies to be embedded into a class so as not to distract students from the lesson content: *'I think it will be help but just in like one hour one technology. If we use three to four technologies in one hour, it will be too hard to focus'* (lines 23-25: 435).

5.1.1.2 Convenience of use

Convenience of use was also viewed as a major benefit in accepting a particular learning technology. For example, Student BP1 praised the flexibility of Moodle as it can be accessed in any location. Moodle was seen as a major positive by all respondents in the first data collection period with some students not having access to any form of VLE previously. Student CP1 had studied at a previous UK HEI at undergraduate level and was more impressed with the current level of engagement due to the academics on his course utilising more of Moodle's functions (such as the use of personalised videos to visually explain assignments and using the discussion forum to provide news and updates for the module).

On the other hand, the use of smartphones in the classroom received a mixed response. Whereas several interviewees praised the convenience of smartphones (due to their portable and accessible nature), other respondents were critical of the distractions that they can cause. For example, Student AP1 was a proponent of their integration into classroom activities as online quizzes can be conducted on smartphones. This was viewed by Student AP1 as *'interactive'* and *'really fun'* (lines 48-50: 61). Conversely, Student JP1 thought their convenience was overshadowed by the number of issues that they can cause (especially their addictive nature) and recommended they were banned by the university. Student JP1 believed it was easier for an academic to understand if a student was using their device for non-studying purposes if only laptops were permitted. The 2016 focus group also discovered that each student was concerned about an apparent addiction to social media (particularly Facebook, followed by Twitter) with both technologies seen as potentially harmful for learning if not self-regulated by the student or monitored and addressed by the teacher.

Nonetheless, Student AP2 was a particular proponent of Moodle due to its portability and ease of use:

> *'You can access it (Moodle) anywhere, anytime, even you can access from India. So, when you are on holidays you can, if you want to, check something. You can do it and I have seen some of the students doing their assignments on the flight in their summer holiday'* (lines 3-9: 294).

The convenience of Moodle was also extolled by Student JP2 who enjoyed its flexibility although admitted she did not always use it to prepare for classes.

The flipped classroom had a mainly negative review with many students not discussing its flexibility and instead deriding the lack of face-to-face contact and the difficulties they had motivating themselves to study without academic input. For instance, Student IP2 stated she felt pressurised to complete flipped activities in her own time and much preferred to study only when she was on campus.

The perceived impact of technology on better grades is now discussed below.

5.1.1.3 Better grades

There was some disagreement evident in this category although the majority of students interviewed agreed that learning technologies had a positive impact on achieving better results. For example, Student HP1 commented that technology was useful in improving the attitude and motivation of students to succeed. He added this in turn led him to be more motivated to study. Furthermore, Student BP1 believed that learning technologies had an indirect impact on her grades as they facilitated greater understanding in a subject. Student EP1 felt that technology was definitely able to improve her grades, as the technologies used were able to focus her attention. Student FP1 added he thought it depended on the individual – if someone was generally motivated they would be equally as likely to learn a new form of technology as well as research a new topic or concept. Nonetheless, two students were unsure whether technology was able to positively affect better grades. Student CP1 said he thought the use of learning technologies had no impact on grade attainment and Student JP1 stated *'not that much'* (line 31: 79). Overall, however, there was a consensus that learning technologies were able to contribute to better grades and influenced student acceptance of particular applications, software and hardware.

The 2017 student interviews unearthed similar comments to those made in 2016. For instance, Student CP2 believed that there was a natural linkage between higher grades and technology usage as the interactivity that was created by utilising learning technologies generated greater interest in the topic. Student DP2 similarly positively articulated the benefits of learning technologies in improving concentration via interactivity. This was particularly seen in seminars (rather than lectures) where technology tended to be embedded more effectively and consistently. Moreover, Student HP2 stated that there was a clear connection between an appropriate usage of learning technologies and enhanced grades due to being able to concentrate more deeply on a subject. Student EP2 also believed that there was a positive correlation between the effective implementation of learning technologies and better grades although she was not sure to what extent.

On the other hand, Student GP2 claimed that there was no tangible connection between the use of learning technologies and achieving higher grades. She stated technology could actually be disruptive (in the negative sense) and timewasting as occasionally online search engines would not work, meaning she would need to conduct her research manually.

The relevance of technology to a future career is articulated below.

5.2 Relevance to future career

Although not evidenced to the same extent as the positive perceived effects on academic performance, the capability of technology to positively impact employability was seen to be an important factor in influencing acceptance in the students who were interviewed. For instance, Student FP1 commented that the technologies he learned at CUL could be applied in a future job. This contrasted positively to another university where he went to as an undergraduate student. A similar remark was also made by Student FP2. Moreover, Student DP1 articulated that she was more likely to accept and use a particular technology if she could apply it in future employment.

This was viewed as a “plus point” although she stated she thought possessing an understanding of technology was not especially helpful in securing a job interview. Student GP1 concurred with the theme of technology being able to enhance employment prospects when stating:

> *‘Now jobs ask for the basic knowledge of the Microsoft. If you can’t use it, I don’t think you would be able to find a proper job’.* (line 5: 89)

This student also thought it was vital to be able to understand how to use PowerPoint effectively. Similar points were made in the first focus group in 2016 with Student DP1FG commenting that he would use several of the applications he had learned at CUL in his future career. The need to use PowerPoint appropriately and to a high level was also observed by Student BP1FG who remarked that it was important to look professional and make a good impression. This student had practiced the PowerPoint techniques she had learned in class in her internship and in doing so was able to effectively capture the attention of her audience. This experience gave her confidence to apply the same or similar techniques in future employment. Student AP1FG said she was satisfied with the techniques she had been exposed to and applied although would like to learn more:

> *‘I think so far so good, but I would still like to know a lot more learning and development techniques because it helps us to utilise them for our careers in the future’.* (line 18: 125)

On the other hand, Student CP1 believed that there was no discernible impact on employability as technology acceptance was not entirely relevant in securing future employment. However, this student stated that he was more likely to accept and use a technology (such as a podcast) if he could use it in an actual job.

Overall, there was a great deal of positivity regarding the potential of learning techniques to effectively influence the process of finding employment as well as enhancing IT literacy when students started work.

5.3 Enhancement of IT literacy

The perceived positive effects on the enhancement of IT literacy was seen as another influential factor facilitating technology acceptance and can be connected to relevance to future career. The vast majority of students stated that they were unfamiliar with a number of the technologies they were introduced to and gained more confidence in using them as the course progressed. This variable was very much linked to 5.2 above with the development of IT skills viewed as important in improving future job prospects. Students were happy that they were able to learn new skills and improve their creativity in the process. For instance, Student GP1 perceived that he had substantially improved his IT skills, which had given him more confidence in creating more interesting and interactive presentations in different modules.

Moreover, the creative element of students possessing the autonomy to invent their own activities based on the content introduced in class was popular for two reasons: focus and improving teamwork. For example, Student DP1 remarked that she felt more responsibility to her group and the seminar tutor when tasked with creating an activity with a particular technology (such as a video). Student EP1 commented that this technique improved engagement and communication between different cultures:

> *'We have people from different culture. So they come together, they discuss and then as a team we start working so we get to know lot of dimensions and at the end we have to agree on like we need common sense same solution so that's a bit difficult part, but eventually it happens and something good comes out. And my teamwork experience has been really good, you know'.* (lines 5-10: 68).

On the other hand, there was a view that certain teachers were more proficient and effective in teaching IT skills when compared to others. There was also a consensus that there was no consistent approach to the usage of technology and each academic had their own way of doing things. The 2016 focus group confirmed the findings above with technology seen as a conduit in enhancing interaction and communication between peers. The students also agreed that each academic had their own individual teaching style with some lecturers more adept and confident using technologies than others.

Confidence in one's ability to effectively utilise various forms of technology also had an impact on student enjoyment and their overall experience on a course.

5.4 Enjoyment [hedonism]

Students enjoyed the competitive nature of quizzes and the resultant collaboration with classmates. The hedonistic nature of ARS was also viewed as significant in influencing student technology acceptance. Students saw YouTube as useful in making classes more engaging, collaborative and as an interesting interlude between receiving lecture and seminar content. Students enjoyed watching interesting and thought-provoking videos.

The interviews from the first data collection period in 2016 demonstrated that the actual enjoyment of partaking in interactive learning technologies had an impact on the decision to accept from a student's perspective. The competitive element of quizzes and group competitions was seen to be another important factor. For example, Student AP1 commented:

> *'It's fun and you get to see everybody's score. It gets competitive and everyone is screaming. It's fun!'* (lines 46-47: 41)

The ability of learning technologies to produce an entertaining and hedonistic experience was commonly seen as useful in increasing student satisfaction, improving the student experience and focusing students on the task at hand. This pedagogical strategy was viewed as a positive new experience when compared to previous learning experiences in other universities. The 2016 focus group agreed that technology possessed the capability to increase enjoyment due to its interactive nature. The students believed that this component was very useful in focusing their classmates on the lesson content and made lessons more enjoyable and more attractive to attend: particularly if the lecturer or seminar tutor had previously used technology to create a positive atmosphere. However, it was noted that seminars tended to be more enjoyable (and thus more attractive to attend) than lectures as the latter tended to be delivered one-way, often with limited audience participation. As will be discussed in the Discussion chapter, these findings can be aligned to the HMSAM framework analysed in Chapter Three, as hedonism in this instance was used to satisfy individual intrinsic motivations.

5.5 Nationality

Nationality as an external variable in influencing technology acceptance was regarded in different ways by various interviewees. For example, some students had the opinion that certain nationalities were more proficient than others based upon their experience in the university although other comments suggested that there was a negligible perceived effect regarding nationality on technology acceptance. For instance, there was disagreement on the IT literacy of Chinese students. Student BP1 commented that Chinese students tended to be weaker with technology when compared to other nationalities and were less likely to use technology as a result. This claim was also made by Student CP1 and Student HP1 with the latter interviewee stating language difficulties and a reluctance to mix with other nationalities contributed to Chinese students not participating in technology-based activities when compared to other nationalities. Nigerian students were also viewed to be less proficient in using technologies and therefore less likely to accept and use them by two students. For example, Student FP1 stated Nigerian students struggled when using technology and Student HP1 observed:

> *'People from Nigeria kind of don't understand what's going on sometimes'.*
> (lines 27-28: 105)

On the other hand, Chinese students were observed to be confident and effective when using technology by several interviewees. For instance, Student EP1 stated:

> *'I have a Chinese classmate and he knows a lot about technology. For example, for my Podcast it was tough for me to compress the video but he did it easily'.* (lines 4-6: 71)

Furthermore, Student FP1 also commented that Chinese students were *'very good'* (line 23: 80) with technology and Student GP1 added that Chinese students are *'very computer literate'* (line 23: 89). Student HP2 also stated that Chinese students were more capable using technologies when compared to other nationalities.

It was discovered that there was a perception that certain students who are quiet in class tend to be proficient with the use of technology. For example, Student EP2 cited the case of a Chinese student who rarely spoke in class although was able to impress her group members with her IT knowledge, skills and abilities.

The interviews in both data collection periods revealed a sense of self-deprecation from a number of students who remarked that they were lacking in competence when compared to their peers. For instance, Student FP2 commented that she was the weakest in the class although the lesson observations confirmed this particular student was more than capable and arguably adept at using and applying a number of applications.

As mentioned above, some students believed nationality was not a factor in facilitating technology acceptance. For example, Student CP1 argued it was dependent on individual students, Student DP1 thought it may be more connected to individual communicative ability and Student JP1 commented *'I don't know if it's a nationality. I'm wondering if its exposure to technology'* (line 54: 115). Student HP2 concurred with the statements made above when exclaiming nationality *'doesn't matter'* (line 53: 427) and *'everyone has the same kind of level'* (line 3: 428). It was also articulated by Student HP2 that age was a more important factor in technological capability. Student HP2 believed that younger students tended to be more knowledgeable and proficient whereas older students did not possess the same understanding. The 2016 focus group also discovered several contradictions regarding technology acceptance by nationality with no real consensus agreed apart from that every student works at a different pace.

Familiarity with technology will now be discussed below.

5.6 Familiarity with technology

This part is arguably linked to the section on nationality above with the majority of students articulating that they had not been introduced to most of the learning technologies implemented on their programme until coming to the UK. This lack of familiarity made certain students apprehensive, at least initially, about accepting and using technology. For example, Student AP1 stated:

> *'In Pakistan, we don't tend to use a lot of technology. Mostly it's like a lecture with a white board or something and maybe a PowerPoint presentation but nothing beyond that'.* (lines 30-32: 41)

It took this student some time to become comfortable using the technology she was introduced to at CUL. Moreover, Student CP1 (from China) described Chinese education as *'one-way'* delivery and inherently focused on rote learning (line 32: 52). He stated it was challenging to become familiar and confident with an interactive learning environment. Student DP1 (from Vietnam) added:

> *'In Vietnam there is technology but it is very basic. We also have a projector and we do presentation like here, but we don't make use of many different new technologies'.* (lines 54-55: 57; line 1: 58)

Student FP1 commented that there was very little technology used in Indian HE when compared to the UK. Similarly, Student GP1 said only minimal technology was used in his undergraduate degree in Egypt and he had a lack of familiarity with the technologies introduced to him in Term 1 of his course. On the other hand, Student IP1 stated she was familiar with several of the technologies at the start of her course as she had similar experiences in Spain, although she was not exposed to technology to the same extent that she was at CUL. In the 2016 focus group, Student DP1 confirmed he had never actually used PowerPoint before coming to the UK.

The theme of not being exposed to technology at university in the students' home countries resonated in 2017. For example, Student BP2 remarked that she had minimal exposure to technology at her previous university in China. This student commented that she much preferred the interaction offered at CUL rather than the one-way delivery she had experienced previously. Student GP2 stated that she had only used presentation software at her previous university in India with most of the technologies she had been introduced to at CUL being unfamiliar albeit interesting and engaging. Moreover, Student DP2 commented that universities in his country (Saudi Arabia) *'(only) use slides and projectors'* (line 3: 345). He articulated that he found the technology offered at CUL more useful in engaging him in the lesson content than the more old-fashioned form of delivery he used to receive. Student DP2 added he had never used Moodle before coming to the UK and found it particularly useful in organising his studies. Although most of the students were unfamiliar with the majority of technologies they were exposed to at CUL, it appears that they were more likely to accept them as they were viewed as more useful and interesting when compared to the previous, more Instructionist form of education they received in their home countries.

In the second student focus group in 2017, there were contrasting opinions made regarding familiarity and confidence using different learning technologies. For instance, Student BP2FG believed that teachers were more proficient and knowledgeable regarding technology usage when compared to students whereas Student CP2FG noted that Chinese students tended to be more confident and familiar than both lecturers and other nationalities. All focus group respondents were in agreement that their effectiveness with technology had improved by the end of their course.

The next section will examine specific learning technologies that were discovered to facilitate greater acceptance in students.

5.7 Why and what specific learning technologies facilitate greater acceptance in students?

As will be discussed, student responses were more influenced by PU than PEOU. The below section is organised into three areas: facilitating (where mostly positive responses were received), mixed-responses (both positive and negative responses) and unpopular (mostly negative responses).

5.7.1 Technologies that facilitate greater acceptance

This research discovered that there were several learning technologies that facilitated greater acceptance in students, albeit with different strengths of acceptance. These were all forms of personalised learning evaluated in Chapter Two (PowerPoint, Audience Response Systems, videos and simulations) and two areas of flexible learning (VLEs and Online International Learning). Mixed responses were received for one area of flexible learning (Mobile phones) and both aspects of flexible socialisation (Facebook and Twitter). Learning technologies that were not perceived to increase acceptance included two aspects of flexible learning (online discussion forums and flipped learning).

5.7.1.1 PowerPoint

PowerPoint was viewed by every student as a familiar, effective and modern learning technology. This was a rather surprising finding due to PowerPoint being commonly regarded as an established tool and one that is not always viewed as particularly innovative or effective in engaging students in the lesson content.

For example, Student DP1 commented that she expected PowerPoint to be delivered in every lesson, as this is what she was used to. As a visual learner, this student found PowerPoint to be a useful tool in receiving and digesting information. The same comment was also made by Student EP1, Student AP2 and Student DP1FG. Student AP1 added that she enjoyed PowerPoint presentations as they were familiar to her. They were also seen as an interactive way of delivering and responding to information. Student HP1 agreed when stating that he was comfortable using PowerPoint as he had used it since he was eight years old. Similarly, Student BP1 found the regularity and consistency of PowerPoint usage to be helpful in her learning. Student EP2 articulated that he was happy to be exposed to PowerPoint presentations at CUL, as this was the main learning technology he was used to as an undergraduate student in Colombia.

Further positive comments were made by Student CP1 who commented that he liked to receive PowerPoint presentations, as they were a helpful way of summarising important topics from a lesson. This student particularly enjoyed the combination of PowerPoint when used with a video, as this approach was able to provide him with more clarity by offering visual examples in addition to the PowerPoint text. Student EP1 made similar comments when articulating that PowerPoint content worked better when used in tandem with videos. She advised content should be focused and relevant in order to capture the main points emanating from a topic. In addition, Student EP1 remarked that she was a proponent of PowerPoint in effectively imparting content, as it was able to provide a suitable amount of information on a topic before the lecturer moved to the next slide.

On the other hand, Student HP1 commented that it is important for PowerPoint slides to be suitably succinct in order to capture the essence of the topic being presented. This student warned against using *'100 words in one slide'* (line 15: 94) as it would be difficult to make the content interesting due to there being too much information to digest. Student HP1 enjoyed the presence of illustrations and diagrams on PowerPoint slides as these made him more curious in asking questions.

Student IP1 added that she thought PowerPoint was a useful learning technology as it helped her to relax in class and she did not need to take any notes. However, she cautioned that it was vital to make slides interactive and if not *'it makes me feel like I'm here for nothing and I think it's useless to be there'* (lines 23-24: 102). Therefore, Student IP1 argued it was vital to make PowerPoint presentations as interactive and as engaging as possible. Indeed, all students involved in the first focus group stated it was important to not only use PowerPoint in class, as this would reduce interest and their concentration span. These students recommended the use of a suite of different techniques to maintain focus on the topic being taught. All students in the first-year focus group concurred that the enthusiasm, passion and clarity of delivery by the lecturer was the most important factor in engaging students through PowerPoint presentations.

Student CP2 was the only student who felt unconfident creating her own PowerPoint slides and was unsure about how to use its various functions. This student recommended that the university offer targeted training sessions so that learners could improve their competency and in turn their future employability prospects.

5.7.1.2 Audience Response Systems

The use of online quizzes in the classroom was very popular with students who found them engaging and fun to participate in. These factors increased technology acceptance. It was noticeable that the majority of comments complimented the ability of quizzes to deliver both a competitive and positive atmosphere as well as improve the quality of the learning experience for students, leading to greater retention of knowledge. These points were influential in facilitating acceptance.

It was also discovered that students were able to use the quizzes they had been introduced to in class in other situations. For instance, Student AP1 was an advocate of Socrative quizzes, which she successfully used to engage her audience when delivering a training session in another module. Student AP1 was also impressed with the hedonistic aspect of quizzes and remarked that they enabled her to better remember the lesson content due to the experience being competitive and memorable. Similar comments were made by Student CP1, Student EP1, Student AP2 and Student GP2 who all enjoyed the competitive aspect of participating in quizzes. Furthermore, Student JP1 commented that she enjoyed reflecting on her performance against others and thinking of how she could improve for the next class.

Student BP1 was another supporter as she was able to learn more closely about the subject being studied. She believed that online quizzes were successful in creating a challenging and exciting environment that was conducive in engaging students. Student CP2 and Student DP2 both claimed that the use of online quizzes in lectures and seminars was helpful in consolidating their knowledge on a subject. Student BP1 added that the use of online quizzes was beneficial in getting her classmates to utilise their mobile phones for purely studying purposes and to prevent distractions from taking place. Student EP2 and Student FP2 said the implementation of quizzes in class actually made a subject more interesting.

Furthermore, Student EP1 commented that quizzes were engaging as they made her *‘so curious to know about what’s going to be next and what’s going to be the result’* (lines 52-53: 66). She also stated that quizzes made her want to know more about how her classmates were performing and if she was a *'good student'* in comparison (line 54: 66). This perceived benefit made her want to try harder. Student HP1 concurred. This student much preferred online quizzes as they helped him to ascertain how well he was performing against his peers (rather than paper-based quizzes which were seen as less interactive and less interesting).

The positive relationship between online quizzes and future employability made a discernible difference on the decision to accept. For example, Student FP1 observed that he was much more likely to accept and use a technology if he could use it in his studies and in a future job. This student gave the example of Kahoot (an interactive online quiz) that he was able to positively use as an ice-breaking activity in a workshop he delivered. He believed his delivery was more engaging and effective due to using this software. He described this as *'eye-catching'* (line 46: 74) and helpful in becoming a more autonomous, self-dependent learner. Student GP1 found the ability to learn then replicate, a useful strategy in delivering training or a workshop. The positive perceived effect on employability was also mentioned by the students in the first focus group. Once again, these students commented that they were much more likely to accept and use an ARS if it had a positive perceived effect on their future job prospects.

Student JP1 enjoyed the use of Moodle quizzes, particularly those that were used at the start of a seminar as a learning check about the contents of the previous lecture. This student found it helpful to review the quiz after class if she did not get a perfect score in the seminar. This strategy was seen as useful in consolidating her learning.

The first and second focus group respondents all agreed that online quizzes were enjoyable and popular as they made lessons fun and the content easier to remember. These students all agreed that quizzes were a useful tool in facilitating learning through a competitive classroom environment. For example, Student DP1FG commented that *'you pay more attention because you know you have to solve the quiz'* (lines 33-34: 118). Students in the second focus group also said they found quizzes helpful in focusing them on the subject being taught.

On the other hand, Student BP2 recommended that lecturers review the answer before continuing to the next question. This student occasionally found it difficult to remember and digest the correct response if the lecturer did not discuss each answer in detail before proceeding to the subsequent quiz question.

5.7.1.3 Videos

Videos were viewed by students to be a generally positive addition to the classroom, particularly for visual learners. For instance, Student AP1, Student BP1 and Student FP2 all believed that the inclusion of a video in a lecture or seminar was a useful strategy in engaging them on a particular topic. This point was also made by Student AP2 who said he looked forward to watching relevant videos in class. Student BP1 added that videos were able to make understanding a particular topic clearer. This student thought videos were another way of conveying information and preferable than only listening to the lecturer. Moreover, Student BP2 articulated that videos were *'very interesting to attract us'* (line 33: 311). Student DP2, Student EP2 and Student CP1FG all believed videos were a useful addition to a class as their usage was able to increase interaction. Additionally, Student FP2 and Student HP2 commented that videos were helpful in improving the classroom atmosphere, particularly if they contained amusing content.

Moreover, Student CP1 elucidated that he was often inspired by the content of videos, as they were able to make classes more interesting and increase his levels of creativity. Similarly, Student FP2 posited that creating her own video as part of a group was an enjoyable seminar activity. This was viewed as more interesting when compared to delivering a PowerPoint presentation and a useful learning gain in increasing future employability. This point was also made by Student HP2.

Student FP1, Student IP1 and Student IP2 all concurred that videos were able to increase their focus and knowledge on a subject. This comment was also made by Student CP2. Student IP1 found TED[23] talks particularly useful as videos such as these enabled her to understand a subject more deeply and provided greater context.

Furthermore, Student CP2 explained that *'videos for me are very important. The use of videos, you know, with real cases'* (lines 31-33: 336). The implementation of

[23] Technology, Entertainment and Design.

videos such as YouTube in this example was seen as important in adding greater understanding to the subject being taught.

However, as a caveat, Student AP1 believed that certain students used the time when a video was being played for non-studying purposes such as checking emails and social media.

The impact of VLEs in facilitating technology acceptance is now discussed below.

5.7.1.4 VLEs (particularly Moodle)

Students were supportive of VLEs such as Moodle (which is used at CUL) due to their PU and convenience of use. For example, Student AP1 stated that Moodle was a valuable resource with Student BP1 commenting that it was useful as it was possible to submit online from *'any part of the world'* (lines 32-33: 46). This student was also happy that Moodle contained important data and links (such as assignment details) in one location. This was viewed as especially helpful and convenient. Similarly, Student GP2 perceived Moodle to be a convenient resource as everything she needed was on one webpage. This meant she did not need to carry any books or documentation to class. These points were also supported by Student CP1, Student DP1, Student AP2 and Student EP2. Moreover, Student EP1 appreciated that the system was also able to provide reminders to students who may forget to carry out a task. This student additionally enjoyed the flexibility offered by Moodle. She was satisfied that she could access content and submit her work at any time she pleased. Moreover, she believed that because she received a receipt (via Turnitin) after submitting her assignment, this function made her feel *'safe'* (line 5: 69). Student BP2 similarly enjoyed Moodle's flexibility as she could review material herself if she was absent for a seminar. Student CP2 also thought Moodle was able to improve his overall student experience.

Student FP1 was a particular proponent of Moodle and stated *'it's like a bible to be honest'* (line 49: 77). This student was impressed by all aspects of Moodle's functionality and said he enjoyed having an integrated system, which contained everything he needed (such as information about his lecturers and link to the online library). Student CP2FG added *'we can find everything'* (line 43: 462). Student CP1 and Student HP1 were especially impressed with Moodle, as they had no previous experience of using a VLE in their own countries (China and Pakistan respectively). These students found Moodle to be helpful in improving their organisation skills. Student IP2 preferred Moodle to Blackboard (which she used in a previous institution) as it was perceived to be more user-friendly.

Although the feedback on Moodle was generally positive, there were nevertheless several comments made by students regarding its imperfections. For example, Student AP1 thought it had too many tabs, making it difficult to navigate although conversely Student DP1 thought Moodle should have more functions integrated. This student suggested that it should also contain information regarding student timetables and fees. These details were found instead on other university systems. Moreover, Student FP1 and Student BP2 believed that the current updated version of Moodle was more confusing than the previous incarnation as it was perceived as difficult to navigate. These students had received no training or information regarding this change and found the present version difficult to use. This point was also made by Student GP1, Student AP2 and Student CP2 who preferred the older version of Moodle as the new system was perceived to be overly complex. Again, these students (along with others) received no training on how to operate the new version. Student IP1 made a stronger point when stating *'I heard some of my classmates don't really understand how Moodle works and they are having some problems with learning technology and it's affecting their grades'* (lines 27-29: 104). The lack of intervention from the university's IT staff was seen to be unhelpful from this student's perspective. Student BP2 and Student CP2 asserted that students should have been trained how to use Moodle in their course induction.

Furthermore, Student GP2 elucidated that Moodle could be better used by herself and her fellow students. This is because students have the opportunity to review lecture and seminar content before classes. However, this student remarked that this rarely happened. Student HP2 also articulated that certain students may choose to avoid attending class as they may feel that they can read the material on Moodle at any time they wanted.

Finally, Student JP2 had mixed feelings regarding the effectiveness of Moodle as an effective learning technology. This student argued it was a useful resource, providing the content was organised and current. However, she was critical of certain lecturers who did not always keep their Moodle page up-to-date or did not include suitably engaging content.

Nonetheless, despite these critical comments the overall view of Moodle was mostly positive.

The influence of Online International Learning in facilitating technology acceptance is discussed in the next section.

5.7.1.5 Online International Learning (OIL)

Although there were fewer responses for OIL when compared to previous technologies, there was a consensus from the students interviewed and in both focus groups that it was an engaging pedagogical strategy. This is because it enabled students to enhance their cultural awareness and communication skills with fellow students and lecturers in a different country in real time. In fact, Student CP1 commented when OIL was used it was his *'favourite type of class'* (line 6: 51). Similar remarks were made by other students such as Student CP2 who appreciated the opportunity to exchange ideas with others, especially if the OIL task was related to learning outcomes and the assignment brief. Student GP2 was another proponent of OIL sessions due to their perceived benefits in improving employability. This student found it useful to build her understanding of other cultures as well as to improve her networking skills.

On the other hand, despite OIL being viewed as an overall positive experience, negative comments were made regarding the inconsistency of the university's Wi-Fi connection from the second-year focus group participants. These students endured several disruptions due to an intermittent internet connection during one of their OIL sessions.

The perceived impact of online simulations is now detailed below.

5.7.1.6 Online simulations

Online simulations were also not discussed in depth, although overall were perceived to be popular with students who enjoyed their interactivity and positive perceived effect on future employment. For instance, Student GP2 thought that simulations were the most effective learning technology in enhancing her IT literacy.

This student was motivated by their competitive edge and commented that she really enjoyed the whole simulation experience. Student AP1 was similarly enthused and articulated that she found it useful to apply her life experience to a simulated activity. This opportunity consolidated her understanding of various subjects. The 2016 and 2017 focus groups demonstrated that the respondents were generally positive about the use of simulations in the curriculum partly due to hedonistic reasons and particularly due to their usefulness in preparing them for future work. This latter point was emphasised in both years, highlighting their popularity with students.

Mixed responses are now examined. In this section, students offered both positive and negative remarks about particular technologies and technological platforms.

5.7.2 Mixed responses

The use of mobile phones and social media were seen by students to be both positive and negative in facilitating technology acceptance. Mobile phones are discussed first.

5.7.2.1 Mobile phones

Students made a number of interesting comments regarding the effectiveness of mobile phones as a pedagogical tool. It was particularly noteworthy that the vast majority of respondents understood both the advantages and disadvantages of their use although all of them agreed that they used their mobile phones for non-studying purposes.

In terms of positive comments, Student AP1 described mobile phones as a beneficial addition to the student experience. This student commented that she *'loved'* using her phone during class time, particularly when participating in quizzes (line 14: 42). Student AP1 found this activity engaging and more interesting than a group discussion or presentation. Furthermore, Student DP2 thought the use of mobile phones in class time was useful and helpful in engaging him in the subject being taught.

On the contrary, Student JP1 offered a more negative response when acknowledging the disadvantages of using mobile phones in the classroom. This student thought that mobile phones should be banned, as she believed students were addicted to them and could not properly concentrate on the lecture and seminar content. Mobile phones were also seen as influencing distractions in class, particularly when acting as a vehicle to social media access.

5.7.2.2. Facebook and Twitter

Facebook and Twitter were seen to have both pros and cons to their use. For instance, Student JP1 thought that her classmates were too easily distracted by social media (such as Facebook and Twitter) when they had their mobile phone in close proximity. Similar comments were made by the students in the first focus group who believed that many of their peers had an addiction to social media with mobile phones perceived to be distracting and unhelpful in their learning. Moreover, Student CP2FG stated that students tended to use mobile phones for non-studying purposes and instead *'look at maybe Facebook or QQ*[24] *or WeChat*[25] *and they look at something different rather than content'*. (lines 43-45: 465)

On the other hand, Facebook and Twitter were seen by several students as helpful in receiving information from academics about forthcoming activities as well as for celebrating past achievements. For example, Student DP2 commented that he often checked the university's Facebook page and Twitter feed for updates on these topics. Students also found Facebook groups to be useful in sharing information when participating in group-work activities. However, it was acknowledged that only a few academics used Facebook and particularly Twitter in their pedagogical strategies.

Unpopular learning technologies are now examined in the next section.

5.7.3 Unpopular learning technologies

Online discussion forums and flipped learning received generally unfavourable responses from students who commented that these technologies did not facilitate technology acceptance nor greater engagement in their studies.

[24] Instant messaging software from China.
[25] Chinese multi-purpose social media mobile application software.

5.7.3.1 Online discussion forums

Despite the pedagogical benefits discussed in the literature review above, online discussion forums were perceived to be more of a nuisance than being helpful. It appears that the students who were interviewed did not appreciate formative work and preparation outside of class. For instance, Student AP1 remarked that she did not think discussion forums were very useful as student participation tended to be minimal.

Despite being a high-performing student, Student CP2 admitted that he rarely looked at the discussion forum as he thought there would not be anything interesting to discuss. Furthermore, Student HP1 saw discussion forums as a negative form of learning. This is because he believed that his classmates would not engage and thought there was no reason for him to do so by himself. This student viewed online discussion forums as a waste of his time. Student IP2 articulated that she did not like being forced to participate outside of class and did not find the Moodle discussion forum a beneficial activity to participate in.

Student JP1 much preferred to engage with only her lecturer rather than with her peers. Similar to Student HP1 above, Student JP1 believed that there would be minimal participation and thought her time could be used more productively by concentrating on other areas of her study.

As will be discussed in Chapter Seven, these results can be connected to the findings of JISC (2017c) who discovered that students wanted more input from their tutors than from fellow students.

5.7.3.2 Flipped Learning

Flipped learning was viewed as unpopular due to the perceived lack of interaction and face-to-face contact. The data demonstrated that there was minimal perceived support with regards to its relationship with seminar preparation. The main reason cited was due to a lack of interactivity which reduced motivation to participate. For instance, Student AP1 said that she didn’t find the flipped slides interactive in one of her core modules. Similar comments were made in two other core modules where flipped learning was implemented. Moreover, several students said there was no link or often a tenuous link between the flipped content and the subsequent seminar. One student (Student HP1) even commented that the flipped approach was overly pressurising:

> *'The reason why is I think for example the flip classroom (sic) I think many students wouldn't do it if they could… that's kind of pressurising some people as well'*. (lines 7-11: 440)

This student was unhappy that he was compelled to watch a flipped class in his own time before a seminar and expected all content to be delivered on campus.

There was only one positive comment from Student BP1 who enjoyed the flexibility offered by the flipped approach:

> *'You can go back, hear, how many more times you want because it is not necessary at one go we understand everything. In class maybe at times we are shy to ask the same question to the professor'.* (lines 41-43: 72)

However, as mentioned above, the feedback was mainly negative due to two main points: the lack of human contact and the perception that face-to-face knowledgecasts (lectures) and seminars are more effective for learning. These issues were mentioned by 12 of the 20 interviewees. For example, Student CP1 stated:

> *'I'm not really sure that would improve my grade because for me I tend to ask questions during class and if I receive that response then it's much better for me'.* (lines 44-46: 40)

Furthermore, Student EP1 admitted that she rarely checked the flipped lecture slides as they were often poorly constructed and she learned more effectively in a face-to-face environment.

5.8 Chapter Five summary

Chapter Five has presented the results from the interviews and focus groups with students. It was discovered that there are six major variables affecting technology acceptance. These include the perceived effect on academic performance, relevance of technology to their future career, enhancement of IT literacy, enjoyment using technology, the nationality of the student and how familiar students were with the technology before they used it. The research also discovered that there were several learning technologies that facilitated greater acceptance in students, albeit with different strengths of acceptance. These are PowerPoint, Audience Response Systems (ARS), videos, VLEs (particularly Moodle), Online International Learning (OIL) and simulations. Mixed responses were received for Mobile phones and social media (especially Facebook and Twitter). Learning technologies that did not increase acceptance included online discussion forums and classes that used flipped learning. Chapter Six will now present the results on academic and institutional technology acceptance.

Chapter Six – Academic team findings

6.0 Introduction to Chapter Six

Chapter Six presents the findings from the academic team, mainly focusing on responses from the academic interviews, which were conducted over a two-year period (2016-2017). In addition, this section will include findings from the academic lesson observations over the same duration as well as the focus group with learning technologists and interviews with senior managers in 2018. The latter two qualitative strategies concentrate on providing recommendations to the institution and wider HE on how to enhance technology acceptance in both students and academics.

The details for every respondent can be found in Tables 12-18 on the next four pages. In terms of coding, letters and numbers are again used to illustrate each particular respondent and the period of data collection. For instance, Academic AP**1** is from data collection period **1 (2016)**, Academic AP**2** is from data collection period **2 (2017)**. Moreover, Academic A**Ob**P**1** signifies a lesson **observation** from data collection period **1 (2016).** Learning Technologist A represents the code from a respondent in the focus group in 2017 and Senior Manager A similarly represents the code for a senior manager in the interviews from 2018.

Table 12: 2016 (Academic interviews)

Name	Subject taught	Teaching experience	Gender
Academic AP1	Business	12 years	Female
Academic BP1	Business	11 years	Male
Academic CP1	Research methods	7 years	Female
Academic DP1	Business and Ethics	4 years	Female
Academic EP1	HRM	11 years	Female

Table 13: 2016 (Academic observations)

Name	Subject taught	Teaching experience	Gender
Academic AObP1	Business	12 years	Female
Academic BObP1	Business	16 years	Female
Academic CObP1	Study Skills	5 years	Male
Academic DObP1	Organisational Behaviour	10 years	Male
Academic EObP1	Business	14 years	Male

Table 14: 2017 (Academic interviews)

Name	Subject taught	Teaching experience	Gender
Academic AP2	Business	12 years	Female
Academic BP2	Skills and business	10 years	Female
Academic CP2	Project management	8 years	Female
Academic DP2	Business	12 years	Female
Academic EP2	Entrepreneurship	14 years	Male

Table 15: 2017 (Academic observations)

Name	Subject taught	Teaching experience	Gender
Academic AObP2	HRM	8 years	Female
Academic BObP2	Business	12 years	Male
Academic CObP2	International Trade	Less than 1 year	Female
Academic DObP2	Study Skills	5 years	Male
Academic EObP2	Business	12 years	Female

Table 16: 2017 (Focus group with learning technologists)

Name	Length of service at CUL	Overall work experience	Gender
Learning Technologist A	3 years	25 years	Male
Learning Technologist B	2 years	22 years	Female
Learning Technologist C	2 years	12 years	Female
Learning Technologist D	5 years	14 years	Female

Table 17: 2018 (Interviews with the institution)

Name	Position	Work experience	Gender
Senior Manager A	Senior Leadership Team	18 years	Female
Senior Manager B	Senior Leadership Team	25 years	Male
Senior Manager C	Senior Leadership Team	10 years	Female
Senior Manager D	Senior Leadership Team	24 years	Male
Senior Manager E	Senior Leadership Team	22 years	Male

6.1 Academics – External variables affecting technology acceptance

This section discusses the various external variables associated with technological acceptance in academics. Before theoretical saturation, there were 12 themes identified in the two-year collection period. These were:

Table 18: Themes from academics

1. Lack of confidence with technology
2. Student expectations
3. Expectations of the institution
4. Lack of time
5. Support from line managers and learning technologists
6. Reliance on proven techniques
7. Difficulties for certain nationalities in accepting and engaging with technology
8. Connection to better student performance
9. Ability to improve classroom engagement/management
10. Link to student employability
11. Improvement in students' IT skills
12. Balanced pedagogical approach

After implementing the constant comparison technique in the CGT process, these 12 variables ultimately became 6, emanating from theoretical saturation after each theme was compared and contrasted. The final variables included the relevance of technologies to their job (developed from points 8 and 9 above), technology pedagogical content knowledge (developed from points 10 and 11), past experience with technology (from points 6 and 7), computer anxiety (from points 1 and 2), university support (points 3 and 5) and the importance of technology when compared to other priorities (points 4 and 12). As in Chapter Five, these results are presented in the form of a hierarchy with the most impactful and most detailed responses discussed first.

The relevance of technology to an academic's job is examined below.

6.2 Job relevance

Job relevance was viewed as a particularly important variable affecting technology acceptance in each of the five academics interviewed in 2016. For instance, Academic AP1 believed that embedding learning technologies into her delivery was useful in giving greater autonomy to students – a strategy she thought was particularly relevant to her role. Arguably, this advantage can be seen as closer to PU (than PEOU) in TAM. In addition, Academic CP1 remarked that the use of learning technologies were able to help students focus on a subject more effectively than if the content was delivered without them. Technology was seen as helpful in facilitating learning and making large lectures and seminars more interesting and attractive for students to attend. Academic EP1 thought technology was able to make her job more straightforward due to its ability to encourage a competitive and collaborative classroom environment. This situation made it easier for her to manage her students.

Academic CP1 also believed that technology was relevant to her job in that it simplified the teaching of second language students:

'I think it's easier to teach second language students….using technology'. (lines 33-35: 145)

Academic CP1 was satisfied that the use of the VLE was convenient for both herself and her students and an important tool in communicating effectively:

> *'I think Moodle obviously has kind of revolutionised education. I think that's really important. Maybe it's taken for granted a little bit and I think maybe people don't understand what you can do with it because you can do many things with it. I think that's really good. It's even got an App so you can get the App on your iPhone now. I think some people don't know that'.* (lines 31-36: 146)

Improved communication was also viewed as a positive by Academic EP1 who was able to use both the VLE and social media (particularly Facebook) to communicate effectively with her students. Academic DP2 was another proponent of Moodle. This academic believed that proficiency with Moodle was a vital part of her job and enabled her to provide a better and more structured learning experience for her students. The ability to answer questions and give feedback was popular with both academics and students with the PU of this strategy highlighted as a significant factor in improving student satisfaction.

Academic DP1 agreed with the comments of Academic CP1 above to some extent, with technology viewed as a valuable tool to facilitate interaction although with the caveat that too much technology (such as the over-usage of videos) can be monotonous and ultimately detrimental to learning. On the other hand, the usage of videos when used appropriately and in moderation was seen to be beneficial in enhancing student interest in a subject by Academic EP1.

Academic EP1 added that technology-enhanced learning was a vital component and relevant to her job due to CUL's reputation as a teaching institution and its promise to embed TEL in its TLA strategy.

Technological, Pedagogical and Content Knowledge is examined in the next section.

6.3 Technological, Pedagogical and Content Knowledge

The results from this section were interesting with a number of academics believing that their students actually possessed more knowledge about technology (although not about the subject content nor the pedagogy) than they did. All of the academics interviewed believed that they had a sufficient level of technological knowledge to deliver interactive classes although there was a general lack of confidence regarding their competence to deliver innovative, "disruptive" and up-to-date techniques. For example, Academic DP1 thought that his colleagues had an average understanding of technology – *'we aren't bad, but we are average'* (line 53: 153) and students possessed limited expectations regarding the technological competence of teachers. Academic DP1 added it was important for academics to adhere to learning outcomes:

> *'I think pedagogical value is key because I think you have to make it fun but that there has to obviously be a learning outcome that has to be achieved'.* (lines 33-35: 26)

There was an acknowledgement that academics tended to utilise common techniques and not go beyond minimum student expectations. Academic AP1 admitted that there was little evaluation regarding the effectiveness of the technologies that were employed. Nonetheless, there was agreement that the use of technology was an effective pedagogical practice due to its relevance to the generation of students being taught (the vast majority of students in CUL are under 30 years of age) and that *'it breaks the monotony'* (Academic AP1; line 18: 127). This use was on the proviso that it was used appropriately, in moderation and combined with "traditional" teaching techniques such as scaffolding vocabulary, role-plays, presentations, learning checks and pair and group work activities. The benefits of using technology to check learning was also viewed as a particular advantage by Academic DP1.

Academic BP1 added that his pedagogical content strategy is aligned as closely as possible to improving employability in his students. This lecturer has infused his curriculum with HRM[26] software to give his students exposure to specific programmes and databases that they were likely to use in the future. This academic has received exceptional student feedback for this approach.

The other interviewees were all positive regarding the effectiveness of appropriate technology, pedagogy and related content being employed in achieving module learning outcomes although there was an acknowledgement that technology by itself was not a panacea in improving student engagement, performance and progression. Indeed, Academic BP1 commented:

> *'It's not an end to itself I think because students don't go to the classroom to play with technology. They are going to learn essentially'*. (lines 53-54: 137)

Academic BP1 also believed that learning technologies can be used to help students who are struggling to keep up in class by simplifying and clarifying content through quizzes, showing videos and building confidence by facilitating understanding

[26] Human Resource Management.

through collaborative activities. In addition, Academic BP1 remarked that the versatile nature of technology allowed him to *'stretch'* more capable students by giving them autonomy and responsibility when collaborating with less confident or able classmates (line 19: 142). The ability to push students with technological tools was also seen as an advantage by Academic CP1. Academic EP1 believed that technology was an effective enabler in the creation and delivery of student-led seminars and student-led quizzes (after students were coached on what to present). This type of seminar was generally able to promote autonomy and increase engagement. Academic EP1 proffered that this strategy was helpful in improving employability (as students were able to demonstrate that they had delivered a university seminar on their CVs).

Academic CP1 commented that it was important for teachers to use technology to deliver relevant and up-to-date content for students. This academic stated that it was essential that flipped classes contained unique content which was both interactive and engaging and not regurgitated in any way. Academic CP1 used technology as her individual *'unique selling point'* (lines 50-51: 142). She believed, as she was the youngest academic in the team that it was important for her to demonstrate to students (some of whom were of a similar age) that she possessed the same level of technological knowledge in order to relate to them. Academic CP1 believed that her use of technology was useful in building her experience as a new teacher and that it had become a *'crutch'* in her approach to teaching (line 55: 142).

Academics in the 2017 data collection period similarly viewed technology as an integral part of their teaching toolkit although there was a general lack of confidence in embedding it throughout the curriculum. Nonetheless, utilising technology was viewed to be a vital aspect of an academic's job. Academic CP2 was particularly supportive of learning technology in realising pedagogical outcomes stating that it *'ticks all the boxes'*. (line 37: 216)

Academic priorities are now evaluated on the next page.

6.4 Priorities

The 2016 interviews with academics demonstrated that they had difficulties prioritising the use of technology with other duties taking precedence. For example, Academic DP1 stated that preparation time is an important factor:

> *'The first thing I always think, OK, how can I create student engagement and then to be honest the second question for me is how much time does it take to prepare? Because if it's very complicated and I'll have to take several hours to get used to the technology and learn how to use it then I would probably think I don't have time for it and I just won't do it'.* (lines 24-28: 150)

In addition, Academic EP1 believed that the time to set-up technology in class was often unnecessarily long and cumbersome due to reliability issues with the university's Wi-Fi connection. This compelled Academic EP1 to prioritise imparting content via a more traditional "one-way" form of delivery. Similarly, Academic CP1 recognised the usefulness of technology in engaging students although observed that it was often difficult to prioritise the time to research and practice new technologies with other tasks (particularly the time needed for lesson preparation) being more important.

Academic AP1 elucidated that she was unable to implement technology as frequently as she wished due to the need to complete other duties first. Moreover, Academic DP1 mentioned that she attended a learning technology conference on her own volition although she had not been able to practice what she discovered due to the busy nature of her position. Academic DP1 found this situation frustrating.

The lack of time to learn and experiment with learning technologies was a common theme throughout the 2017 academic interviews. For instance, Academic AP2 said she felt under pressure to embed flipped learning into one of her modules. This academic was given a limited amount of time and received only two training sessions, which she found to be insufficient. The short turnaround was compounded by the need to teach and mark at the same time. She described this experience as *'very, very stressful'* (lines 45-47: 171). Academic CP2 was open that she did not have enough time to properly prepare for classes, particularly if she wanted to try something different (such as integrating a new learning technology into a lesson). As a result, this academic tended to rely on more established teaching techniques.

University support is investigated in the next section.

6.5 University support

The interviews with academics revealed that there was an expectation by the university for its academics to implement learning technologies inside and outside of the classroom in order to provide clear communication and to better engage students. However, it was evident that there was no clear strategy and it was left up to individual academics to decide in what way they would embed TEL into the curriculum. There were no formal training sessions organised and the sharing of ideas tended to take place on an informal and ad-hoc basis. For example, Academic AP2 commented that there was *'no proper formal training'* (line 45: 173). This academic found the lack of a formal training system to be unusual considering the emphasis the university played on TEL. Furthermore, Academic BP2 stated that she had received no training whatsoever on how to embed learning technologies into her classes. Academic DP2 said she had only received one form of technology-based training in the four years she had worked at CUL when she attended a session on how to use an interactive whiteboard. Academic DP1 also believed she had received insufficient training since she started working at the university. Academic EP1 elucidated that he received training on how to use VLEs from the learning technology team when he first started although he did not find this training to be useful as he was already familiar with the functionality of Moodle due to using it frequently at past institutions. Academic EP1 believed a wider and more comprehensive training programme should be offered.

The lack of clarity regarding the university's strategy on the use of technology as well as the ad-hoc nature of the information that was shared, negatively affected technology acceptance in academics. This was viewed as rather surprising due to CUL being a teaching-focused institution. For example, Academic BP1 acknowledged that she needed to use technology as that was what the university expected although she was unsure what to use and how frequently. Academic DP1 was particularly critical of the university's support:

> *'I think it would be great for the university to have a strategy, some sort of strategy that supports those who want to use technology…. and also giving them time to develop or giving them time or allowing them to go on a course for example and train. Because right now I think, it is just up to whatever extra work someone has. I don't think the university can move forward if there is no kind of overall strategy'.* (lines 25-30: 154)

The lack of specific university support regarding training and having enough time to research about technology's impact as part of an integrated pedagogical approach was instrumental in influencing technology acceptance in academics. The pressure to achieve high levels of student satisfaction created greater anxiety in the academics interviewed. Although they were aware of the need to produce high quality lessons as professionals and to help the university's ranking and growing reputation, the lack of guidance and understanding about how to create an effective strategy was seen as stressful and demotivating.

Academic EP2 believed that there was a lack of budget allocated to training academics in improving their effectiveness with learning technologies. This perceived lack of university support was viewed to be a particularly demotivating factor.

Academic anxiety was another factor which impacted on technology acceptance and is detailed in the following section.

6.6 Anxiety

Academic CP1 said she felt compelled to use technologies (despite not always having confidence in how to utilise them properly) as the institution had made it clear that they had made a great deal of investment into their use. Moreover, Academic DP1 thought the use of learning technologies was an expectation from students and commented that she sometimes found it challenging to meet these expectations. On the other hand, other academics believed that the nationality of the student was often correlated with their expectations with those exposed to technology in their home countries seen as more demanding than those from backgrounds with minimal exposure to technology generally easier to please. This is because these students were more likely to be impressed with something they had not seen before. However, it was also stated that nationalities with limited experience with technology could induce anxiety.

For instance, Academic DP1 articulated that certain nationalities gave him more anxiety than others with African students seen as occasionally stressful to teach:

> *'I sometimes find maybe African students are a bit less proficient. I don't have that many African students but the only time I've ever heard from someone say "I don't have a laptop" is from an African student'.* (lines 5-8: 153)

Academic EP1 made similar comments regarding Nigerian students and stated that their lack of prior experience with technology could often make classes problematic to teach due to the amount of explanations and demonstrations that were sometimes required. This was seen to be a waste of valuable lesson time. Academics also struggled to keep the rest of the class engaged (those who possessed the requisite technological knowledge) whilst these students were receiving explanations.

Academic AP2 believed that language issues (particularly with Chinese students) were a more prevailing factor that affected acceptance rather than their own technological ability. This academic noted that she often spent time explaining how to operate a particular learning technology, which took time away from completing the task she had planned. The same point was made by Academic BP2 and Academic DP2 who discussed language barriers being influential in restricting the quality of lessons she could deliver. These academics understood the differences in student abilities yet found it occasionally frustrating when they were unable to teach what they had prepared. Furthermore, Academic CP2 said that she often felt anxious teaching Asian students who were less used to interactive classes and more experienced receiving rote learning:

> *'I would say probably Asian students. Simply because the difference between the education systems back in their countries compared to the UK education system. It's very different'.* (lines 27-31: 221)

In addition, it was discovered that learning technologies did not always work with Chinese students due to their lack of confidence in interacting with others. For example, Academic EP1 commented:

> *'I find it hard to teach Chinese students because of their lack of responsiveness I would say. As they are socialised or the way they grow up, they learn not to talk back to teachers and I think not to question teachers. Therefore, what we do in all our activities actually requires students to talk and to discuss and engage and I think they are just not used to it and that makes it hard to teach them'.* (lines 53-55: 152; lines 1-3: 153)

In addition, Academic DP2 believed that male Arabic students were more likely to accept a particular learning technology if it was delivered by a male lecturer. Academic DP2 said she had struggled on several occasions to effectively engage male Arabic students due to a perceived lack of respect on their behalf. This academic found this situation to be both challenging and stressful.

It was also commented by academics that the lack of impact engaging certain nationalities would make them less likely to persevere or experiment with new technologies in the future with more traditional teaching approaches (such as delivering lectures and using case studies in seminars) seen as less adventurous although at the same time potentially more effective (and less time-consuming to organise).

All academics said they felt anxiety (and in some cases embarrassment) when the technology did not work and they had to improvise with other ideas in front of students. Academic CP1 commented that his students knew more about technology than him and occasionally needed to call on their help:

> *'I think most of the time they know more than me about how to deal with things and how to use things. A couple of times, when I couldn't work out how to get the screen on, they helped me'.* (lines 15-18: 146)

Academic CP2 said she felt stress when she felt compelled to experiment with technology despite not having the requisite knowledge and confidence to do so. This academic thought that she might be compared negatively with more proficient colleagues if she did not try out new ideas. The perceived risk of experimenting with technology and failing was also mentioned. Academic CP2 was open that she preferred to use established and more conservative techniques than to try something different and suffer poor student satisfaction statistics.

GDPR compliance was viewed as another factor causing anxiety, with academics unsure of what technology they were able to utilise in their classes without receiving serious repercussions. This situation made academics hesitant to experiment with new software.

Academic past experiences with technology are now examined below.

6.7 Past experience

The interviews confirmed that academics who enjoyed previous successes with technology were more likely to repeat the same strategy with different cohorts. Conversely, those academics who had struggled with technology or found it difficult to achieve expected results both at CUL and in past institutions were more hesitant to accept technology that was commonly used by their colleagues as well as experiment with innovative platforms. For instance, Academic BP1 enjoyed success with an OIL project and was able to inspire both his students and colleagues to engage with the session he organised. He was also successful in encouraging further communication from this project by using social media. This gave him a great deal of satisfaction. Furthermore, Academic CP1 received positive feedback from a teaching observation. This gave her more confidence about replicating the same pedagogical strategy with learning technologies in future classes. On the other hand, academics who had attempted to use technologies to engage large numbers of students and failed in the process, had a different perspective. For example, Academic EP1 commented that she had used technology in a lecture with 140 students and was not able to engage the audience despite her best efforts. She found this experience a huge challenge. The theme of being put off if a technology did not meet expectations also emerged in the 2017 data collection period. Academics were open that they were reluctant to persevere using a technology more than once if it had not achieved what they wanted on the first occasion. These academics were wary about damaging their reputation in front of students.

Moreover, Academic AP2 stated she felt she was *'thrown into the deep end'* (line 43: 172) when she first started at CUL and was shocked about being required to embed technology into the curriculum without any prior training. This academic was confident using PowerPoint and Blackboard although had no previous experience of Moodle and other learning technologies. Moreover, Academic AP2 accused the university of being overly ambitious in trying to accomplish a number of objectives with learning technologies that were seen to be disparate and did not form a part of any pedagogical strategy. Academic AP2 said she gradually developed more familiarity with learning technologies due to feedback from her line manager after lesson observations, her Postgraduate teaching course and informal discussions with her peers in the staffroom. Academic BP2 also elucidated that she was only able to improve her familiarity and confidence with technology after participating in her teaching course.

A discussion on the specific learning technologies that facilitate greater acceptance in academics is now articulated.

6.8 Why and what learning technologies facilitate greater acceptance in academics?

It was discovered that there were both similarities and differences between academics and students regarding the effectiveness of the technologies that were used inside and outside of class. These perspectives are discussed below.

6.8.1 Positive Perceived Usefulness and Perceived Ease of Use

The academics interviewed in both data collection periods shared similar opinions with their approach to teaching which focused on enhancing student confidence and performance through the use of technology, pedagogy and improving content knowledge. The VLE was seen by both academics and students to be a valuable resource in presenting and clarifying information. However, there was a desire by academics for students to become more involved in the discussion forum. This was viewed as useful by academics in imparting new knowledge and generating discussion although less useful by students who prioritised summative work over formative discussions. On the other hand, flipped learning was viewed to be generally unhelpful by students who preferred more contact time with teachers and onerous and unhelpful by lecturers who believed it was unable to deliver any significant pedagogical benefits. Like students, academics found it useful to include interactive activities such as quizzes in class in order to increase engagement in the topic as well as improve the classroom atmosphere.

Positive PEOU was the most impactful variable evident for academics. Due to the lack of preparation time and lack of recognised formal training, many academics tended to use simple technologies frequently (such as PowerPoint and basic quizzes) which did not require in-depth research and a significant amount of time to prepare. Social media was seen as a somewhat double-edged sword by academics who found it useful as a tool to communicate (especially outside of class) although the difficulties in getting students to avoid using it during a lesson saw it viewed as generally more trouble than it was worth.

The results from the lesson observations are analysed in the next section.

6.9 Academic lesson observations

As mentioned above, the lesson observation strategy over the two-year period had several purposes: to ascertain the extent to which academics used technology in the same way that they stated in the interviews, kept up with the evolving nature of technology (rather than relying on established platforms) and to observe its effects on student engagement at first-hand. The duration of each lesson observation was 60 minutes. Seminars were selected for each observation as they were seen as more likely to be infused with technology than lectures.

The results from the first collection period (2016) were rather mixed with some academics demonstrating confidence and creativity in their application of learning technologies with other observations showing certain academics were much more reliant on traditional techniques and used minimal or even no technology in their classes.

For instance, in addition to using PowerPoint, Academic AObP1 used an application at the start of the class to scaffold ideas on the lesson content. She tended to focus more on group work and the use of a case study to generate discussion. The students in this class visibly enjoyed the scaffolding activity although were distracted for much of the class and tended to use their mobile phones for non-studying purposes. Academic BObP1 also used PowerPoint and one additional form of technology at the start of the class (an ARS to clarify understanding of the topic being taught). This activity was very popular with students and led to a positive classroom atmosphere. However, students started to lose interest after 10 minutes (the quiz was 15 minutes in duration). Academic BObP1 then used more traditional teaching techniques (including having a debate to generate discussion). As in Academic AObP1's class, students were distracted by their mobile phones after they lost interest in the ARS, especially when they were waiting for slower students to complete the activity. Academic CObP1 only used PowerPoint slides. He focused on a kinaesthetic learning approach and got students to work together to solve problems. This technique was generally successful and generated a lively discussion. Academic DObP1 did not use any form of technology (PowerPoint was not used) and instead spoke at his students for one hour with minimal interaction. The students in this class looked disinterested and resorted to looking at their mobile phones after 5 minutes. Academic EObP1 used PowerPoint slides only. His class was relatively interactive and was interspersed with humour although he had difficulties maintaining student concentration. As in the above observations, when students lost focus they tended to use their mobile phones for non-studying purposes. This academic reminded his students about only using their devices for studying although it was noticeable there were several “repeat offenders” who ignored this instruction.

The 2017 lesson observations again demonstrated mixed results with an inconsistent use of learning technologies in the classroom in evidence. For example, Academic AObP2 only used PowerPoint and had great difficulty in getting his students to focus on the lesson content with much of the class using their mobile phones for non-studying purposes. Academic AObP2 was visibly unhappy at the perceived lack of respect she received and admonished her students for not concentrating. This academic actually informed her students at the start of the class that mobile phones were only to be used when she gave permission although this instruction was seemingly ignored by the vast majority.

Academic BObP2 was much more successful in his class and was able to effectively infuse a number of learning technologies and improve engagement with his students as a result. Like Academic AObP2, Academic BObP2 gave ground rules at the start of the class in that students were not allowed to use their phones unless they had permission. Most (not all) of the students complied with this instruction. This academic used learning technologies in conjunction with traditional teaching techniques (including debates, presentations and group work) and was particularly effective in using ARS to create a positive classroom atmosphere and engage his students in the content (International Business Cultures) being discussed.

Academic CObP2 used PowerPoint for the vast majority of her lecture and visibly struggled to generate interaction and discussion despite her best efforts. This academic delivered a more traditional style of instruction and focused on asking questions in order to elicit opinions and solicit responses. No other form of learning technology was used in this class.

Academic DObP2 again mainly used PowerPoint in his class although was successful in generating discussion and creating a reasonably lively atmosphere.

This academic used learning checks well and demonstrated enthusiasm and empathy throughout the class. The students were alert and appeared to be comfortable in his company.

Academic EObP2 demonstrated confidence in her delivery. This academic used both traditional (mainly kinaesthetic techniques that were connected to problem-based learning) in order to engage her class in the lesson content (Corporate Social Responsibility). Academic EObP2 set ground rules about only using mobile phones when instructed at the start of the class. This instruction was generally followed. Academic EObP2 used ARS as a learning check, an online timer when conducting an activity and also introduced a video to clarify different concepts. These strategies were all well received. The combination of applying traditional teaching techniques and varied learning technologies were able to create a positive and productive classroom environment.

The results from the focus group with learning technologists are now examined below.

6.10 Focus group with learning technologists

The focus group with the learning technologists demonstrated that there were two kinds of academics – those that sought advice on how to improve their skill-sets and those that paid little or no attention. The learning technology team attempted to improve their offering by creating a suite of courses designed to enhance IT literacy although admittedly they had only achieved minimal success with this strategy. Learning Technologist B described this situation as *'a real big problem'* (line 35-37: 475).

All learning technologists agreed that they tended to react to issues and adopt an ad-hoc approach, as they did not receive clear instructions from the university on any particular strategy to adopt. Learning Technologist C felt this was *'frustrating and stressful'* (line 49: 475). Learning Technologist C remarked that she had made a number of suggestions for the university to consider to improve this situation although felt that she was ignored.

Learning Technologist A attempted to create training sessions at convenient times for academics to attend (such as avoiding marking periods) although was disappointed that the sessions he had organised tended to be sparsely attended. He felt the general lack of interest shown in improving competency with learning technologies was likely to have a detrimental effect on lesson quality. As a result, he felt discouraged and reluctant to offer further training.

The main source of consternation agreed by each learning technologist was *'the lack of institutional direction'* (line 3: 479). This issue was seen to be the most serious factor in reducing the quality of provision offered by the learning technology team. They stated that without having a clear strategy which focused on developing areas of need and without the ability to influence the involvement of academics at training sessions (such as making attendance compulsory and part of a CPD programme) they felt powerless in effectively supporting the enhancement and embedding of learning technologies into the curriculum. Moreover, they believed that if academics did not possess the requisite digital competencies, this skills gap may result in negative repercussions for student employability (one of the most influential outcomes discovered in this thesis that facilitated technology acceptance).

The final part of Chapter Six discusses the results from the interviews with senior management.

6.11 Interviews with senior management

The interviews with senior management yielded a number of interesting findings regarding their recommendations for the current provision of learning technologies and how they saw this changing in the future.

Senior Manager A emphasised the importance of both students and academics having a consistent experience with the recommendation that a few selected technologies should be used throughout the student learning experience so that there would be no need for constant training of academics and students would be able to focus on learning a manageable number of technologies. However, there was no criteria discussed on how these technologies would be selected as well as no comment made on how this strategy would enable the university to keep pace with the rapid evolvement of technology. Perhaps surprisingly, Senior Manager A also made no mention regarding how student employability would be considered in this approach. Furthermore, Senior Manager A advised giving academics “more space to fail” in that experimentation with new learning technologies was recommended. However, there was also the acknowledgement that the nature of experimentation and taking risks with something new may be off-putting for academics who could be concerned about potential consequences from line managers if their student satisfaction statistics suffered. It was interesting that Senior Manager A was advocating an arguably ad-hoc approach where academics were encouraged to experiment. This was seemingly not part of a specific and overarching university strategy led by senior management and was suggested without input from the learning technology team.

Senior Manager B was focused on evaluating the current impact of the learning technology offering before considering alternative approaches. This interviewee considered that technological change may take time to occur due to the vast number of academics who may have different pedagogical interests and priorities. Senior Manager B was keen to avoid burnout in academics and like Senior Manager A above, recommended that the university should invest in fewer technologies than it currently does in order for both students and academics to have manageable workloads. Again, there was no mention on how these technologies would be selected and sourced.

Senior Manager C acknowledged that there were a number of difficulties with academics accepting to use a particular technology due to prioritising other duties (as mentioned by Senior Manager B above) and that some may be resistant because of the potential risk associated with student satisfaction feedback. Senior Manager C also articulated that it was difficult to get academics to accept and use technology due to its continuously evolving nature. This senior manager stated that several academics saw no point in undergoing training, as they perceived the content would soon be redundant. A common complaint was made against Moodle with many academics unsure why it was updated so regularly. Interestingly, Senior Manager C believed that the terminology associated with technology may prove to be inhibiting in its acceptance. Senior Manager C provided the example of flipped learning and commented that a number of academics expressed their concerns about employing it as a pedagogical strategy when it was first introduced although when they understood its actual meaning, it was discovered that several academics had already been using similar strategies in their pedagogical practices. Senior Manager C firmly believed that it was important to help academics to become self-sufficient with learning technologies when exclaiming:

> *‘Give a man a fish, and you feed him for a day. Teach a man to fish, and you feed him for a lifetime’.* (lines 35-39: 540).

This saying was applied to academics when recommending it was important for everyone to take ownership of their teaching and to ultimately become more confident in their delivery. Crucially, Senior Manager C opined that although the university and learning technology team did its best to respond to requests from academics she conceded:

> *‘The structure could be better and I think there is not a lot of knowledge about what technologies are available’.* (lines 1-3: 549)

She also admitted that there was a great deal of bureaucracy throughout the university, which tended to delay the formalisation of any decisions. This issue resulted in investment in new technologies being made gradually which she perceived to be both inefficient and ineffective due to the ephemeral nature of technology.

Senior Manager D believed that students had a lack of tolerance regarding any issues with technology (such as Wi-Fi connection problems) due to becoming accustomed to using technology regularly on a daily basis. Senior Manager D affirmed that students required a constant supply of information from the university that was accessible to all. He stated that if this provision was not in place, it had the potential to *‘destroy’* student satisfaction (line 49: 561). Furthermore, Senior Manager D contended it was vital for the university to embed technology into the curriculum in order to enhance student cultural awareness and to improve future employability. He also suggested that technology could be used to create an international community of learning for students. Interestingly, Senior Manager D was the only participant to mention the importance of developing student employability through technology use:

> *'Working in a multi-national company, you've got to communicate across cultural boundaries and be aware of cultural sensitivities and I think that's where I think we can support students in how they apply technologies and use them appropriately, how they communicate professionally like in an online environment is important'.* (lines 17-27: 563)

However, there was no strategy given on how to implement this suggestion or if the current provision was working to an expected standard. Indeed, there was more of a general acknowledgement that the current standard of technology that was offered to students could be more effective. For example, Senior Manager D stated:

> *'I think technology is still not there, in learning. I think the VLE is outdated'*. (line 53: 564; line 1: 565)

These admissions were interesting and indicated that the university needed to formulate a cohesive pedagogical strategy that better utilised technology to engage both students and academics.

Senior Manager E commented that the university understood the need to integrate digital technologies more effectively into the curriculum and student experience and acknowledged that the current provision required *'a change of approach'* (line 43: 569). Senior Manager E is hoping that the university's Postgraduate Certificate in HE teaching practice (an obligatory course for new academics) will be able to enhance digital literacy although there were no comments made on supporting the vast majority of academics who had already completed the qualification. Senior Manager E also elucidated the importance of having line manager support for academics who want to become more involved in researching and applying technology in their classes due to the need in meeting student expectations. This comment was made in reference to Senior Manager E conducting a survey with 250 students in 2014 about their expectations and discovering that they expected technology to be a major part of their learning experience.

6.12 Chapter Six summary

Chapter Six has presented the results from the interviews and lesson observations with academics, the focus group with learning technologists and interviews with prominent policy makers and strategists in the institution. It was discovered that there were different influences and perceptions of technology when academics were compared to students. Academics are generally more influenced by the PEOU of technology and less by its PU (although the two most significant variables - Job relevance and Technology Pedagogical Content Knowledge were most commonly cited as influential external variables by academics). However, four variables related to PEOU were all discovered as key influencers for technology acceptance - Past experience, Anxiety, University support and Priorities. The cumulative responses for these four variables were richer and deeper than the former two. It was also discovered that the lack of a uniform strategy elucidated by academics and the learning technologists was confirmed in the interviews with the senior managers.

Chapter Seven will now provide a detailed discussion of the findings in Chapters Five and Six in relation to both literature reviews and present the conceptual framework that emerged from the research.

Chapter Seven – Discussion

7.0 Introduction to Chapter Seven

Chapter Seven discusses the results from Chapters Five and Six in order to identify how and why technology acceptance can improve teaching effectiveness and student performance at Coventry University London. Specifically, this chapter analyses the extent to which the external variables discussed in previous chapters have an impact on technology acceptance in students and academics. To accomplish the aim mentioned above, the reasons why specific learning technologies facilitate greater acceptance in students and academics are critically examined and a discussion on how students and academics differ in their attitudes to the PU and PEOU of learning technologies is analysed. Relationships with relevant empirical research and theoretical frameworks from the literature review are critically evaluated and debated throughout this chapter.

Chapter Seven is separated into several main sections with PU and PEOU in students and academics representing the majority of the chapter. Each of the external variables discovered as a result of the research in relation to students and academics are analysed in connection to these two areas. After that, a critical discussion surrounding the findings from the focus group with the learning technologists and interviews with senior managers from the institution is delivered. Finally, the resultant conceptual framework that originated from these discussions is presented and justified at the end of the chapter. First of all, PU will be evaluated.

7.1 Perceived Usefulness (PU)

This section is separated into two areas: PU in students and PU in academics. PU in students is discussed first.

7.1.1 PU in students

It was discovered that certain external variables do have an impact on technology acceptance in students with six in particular possessing an influence on PEOU and PU. Four variables were associated with PU in students: Effect on academic performance, Relevance to future career, Enhancement of IT literacy and Enjoyment - which is also termed as “hedonism”. As is subsequently elucidated, this finding indicates that the students interviewed are generally more focused on the usefulness of the technologies they utilise rather than how easy they are perceived to use. These results are now discussed in detail with examples provided on specific learning technologies throughout the chapter.

7.1.1.1 Effect on academic performance

The research discovered that students were likely to accept and use a particular technology if it had positive perceived benefits in improving grades and provided opportunities to progress. With regards to specific learning technologies, this finding can be connected to Bartsch and Cobern’s (2003) study who discovered that students perceived learning technologies such as PowerPoint to be beneficial in increasing content recall. Similarly, the findings of Atkins-Sayre et al. (1998) and Basturk (2008) can be associated with this discovery as they found students believed PowerPoint to be helpful in enhancing subject retention, their interest and general understanding. PowerPoint was viewed to be a particularly useful technology in improving academic performance, further echoing the arguments of Farley et al. (2015) and James et al. (2006) with it seen to be valuable in facilitating cognitive recall, classroom interaction and improved classroom focus. The students in the study believed that they performed better when PowerPoint was used effectively, further concurring with the findings of Lowry (1999) and Gabriel (2008). However, these results were in contrast to the studies of Amare (2006) and Daniels (1999) who noted there were no connections between PowerPoint usage and student performance.

This thesis discovered PowerPoint to be useful in improving cognitive recall, classroom interaction, enhanced lesson focus and ultimately better perceived academic performance.

Both positive and negative findings were discovered regarding mobile phones.

It was especially interesting that some students saw the use of mobile phones as effective in breaking the monotony in classes and actually quite helpful in re-focusing them on the content that was being delivered. Rather than being a major distractor that inhibits learning, several students commented on their capability in aiding their attention span which correlates to Mayer’s (1996) discussion on information processing theory. On the other hand, different students were more critical of the use of mobile phones in the classroom and were concerned that they were distracting for both themselves and their peers. Indeed, this issue was particularly evident in the majority of lesson observations with a number of students seemingly unable to focus on the lesson content due to being distracted by their mobile devices. This situation was prevalent despite many academics setting ground rules (and students seemingly agreeing) regarding their proper usage at the start of the class.

In summary, these findings demonstrate that the PU of mobile phones can be viewed in both positive and negative terms: in facilitating technology acceptance as well as acting as an obstacle to academic delivery and performance in the classroom. I found this paradox interesting, as there were a number of different opinions provided by both students and academics. In many ways, this finding mirrors the arguments from the literature review. For instance, Kuznekoff and Titsworth (2013) criticise mobile phones for being overly distracting and Wei et al. (2012) for being unhelpful for students in self-regulating their own behaviour. Wood et al.’s (2012) study which discovered that students who engage in multi-tasking with mobile phones and are unable to produce a consistently high level of performance as a result also resonated in this thesis. Nonetheless, the results do appear to reveal that mobile phones possess the potential to be used as an effective classroom resource provided they are used purely for pedagogical purposes.

Moodle was found to be a particularly relevant example of PU and was appreciated by the vast majority of students who valued its flexibility and capability to encompass integrated functionality. VLEs were seen as a convenient resource by students who could access comprehensive and connected information whenever they needed. However, this finding does not resonate with Demian and Morrice's (2012) study, which found there was a limited correlation between the academic performance of students and the length of time that they engaged with a VLE. Instead, this research has demonstrated quite the opposite in that Moodle was appreciated by a vast number of students who believed it contributed to enhanced academic performance, albeit with some concern that the latest version was more complicated to use than the former. It was disappointing to discover that students were unhappy with a perceived lack of attention given to this issue by the university with students receiving little training on how to use each of Moodle's functions. It appeared that this situation did not overly affect technology acceptance, although it is recommended that the university should devise and deliver a clear and cohesive training programme on how the latest version of Moodle operates. This recommendation is discussed in greater depth in Chapter Eight. Nonetheless, the thesis uncovered that Moodle was perceived to be one of the most useful learning technologies with students who believed that the greater the involvement with Moodle, the better the effect it would have on their academic performance.

However, this study discovered that there was a general reluctance by students to engage with online Moodle discussion forums as they were seen to be not especially useful (despite possessing seemingly obvious pedagogical benefits). This rather surprising finding goes against the arguments of Balaji and Chakrabarti (2010: 1) and Karacapilidis and Papadias (2001) who contend that online discussion forums are a popular platform in which to facilitate communication between peers and tutors with the capability to receive rapid feedback one of its most useful aspects. There was also no evidence of Deng and Tavares' (2013) study who maintain that Moodle discussion forums are more likely to provoke a lively and more spirited debate compared to a face-to-face situation. The students interviewed in this thesis were particularly vociferous regarding the perceived negatives from participating in online discussion forums with many of them viewing this activity to be a waste of time as they thought their peers would not participate, rendering their own contributions to be unimportant. This discovery perhaps suggests that these students were more focused on summative rather than formative work. The intensive nature of the MBA programme may have contributed to this finding as students only have a total of 33 teaching weeks to complete their studies. This scenario may compel students to focus more of their time on summative assignments rather than formative work due to the lack of time they have available.

Considering the rather haphazard and arguably incoherent institutional approach to embedding learning technologies into the curriculum and the inconsistencies that were evident in the pedagogical approach of each academic, it was interesting that the majority of students were able to identify with a perceived common approach. Students perceived that there was a learning technologies strategy in place although they were not able to articulate any specifics. However, it was discovered that although there were certain academics who were able to utilise technology to effectively enhance student performance, the technologies that were used tended to be the same and were lacking in innovation. The lesson observations over the two-year period solidified this finding with very little innovation or experimentation evident confirming the arguments of Flavin and Quintero (2018) and UCISA (2018). There was very little indication of academics implementing new forms of learning technologies with the vast majority of those observed content to persevere with PowerPoint. It was also noticeable that the latest learning technologies introduced in workshops delivered by the learning technology team in 2016 and 2017 (which were admittedly poorly attended) were not embedded into any lesson observation during the same period. Although it was impractical to watch every academic on campus during the same timeframe, it was nonetheless disappointing that no new forms of technology were practiced by the 10 academics who were observed. This finding can be connected to Cuban's (2001) study who discovered that lecturers generally use existing "tried and tested" teaching strategies rather than implementing new technologies when attempting to increase student engagement and performance. In the lesson observations, some academics used videos and ARS although there were others who delivered one-way, lecture-style seminars. These academics had varied success with this approach with the most successful classes (those where students were visibly more engaged and the classroom atmosphere was livelier) using a combination of both common teaching techniques and interactive learning technologies. This balanced style was visibly more effective and was reflected in the positive student satisfaction given (both qualitatively and quantitatively), grade averages and progression rates achieved by the students in these modules. This finding also confirms the suggestion that students do not necessarily want more technology, rather technology that is equivalent with their learning needs, familiar and relevant to their personal development. This thesis discovered that technology should also be used in conjunction with more established teaching strategies in order to better assimilate international students from various learning backgrounds who are generally used to a different way of learning. The impact of learning technologies will also be more pronounced if they are used sparingly and in a more targeted way. The research established that students perceived the ability of academics to deliver a balanced teaching approach to be essential in their own personal development and overall academic performance.

On the other hand, the students who participated in the study made no mention of any specific technologies being able to generate deep and sustained learning. This finding is disappointing given that Lee (2013) demonstrates that learners who have a deep approach to learning have the highest level of engagement and achieve the best results. The students in this study appeared to be more motivated by extrinsic means (the achievement of high grades and progression) rather than intrinsic motivators (such as knowledge acquisition and skills development). As mentioned earlier, the intense nature of the course may have compelled these students to focus more on surface/strategic learning so that they were able to effectively complete their numerous summative assessments.

Overall, the positive perceived impact of learning technologies on academic performance was found to be the most vital and influential external variable that facilitated technology acceptance due to its almost universally positive PU. Only one student believed there was a negligible relationship.

Relevance to future career was another key variable associated to PU. This is discussed in the next section.

7.1.1.2 Relevance to future career

The research has discovered that that there is an impactful correlation with technology acceptance and the perceived positive impact it had on future employability (Taylor 2018). The majority of students interviewed in the first data collection period remarked that they were more likely to accept and use a particular technology if it had a positive perceived influence on their future career. The second data collection period in 2017 illustrated similar findings with students extolling the importance of learning technologies being focused on improving employability skills (Taylor 2018). This discovery is arguably one of the most important results found in the thesis with the magnitude of this correlation not evident to the same extent in any previous studies. This study has established that students are satisfied about being able to add the IT skills they learn inside and outside of class to their CVs in order to improve their attractiveness to future employers.

The opportunity to utilise learning technologies when conducting training sessions and presentations in a future role enhanced technology acceptance. Both PowerPoint and ARS were viewed as particularly attractive and useful in this regard. Arguably, these benefits are to some extent in keeping with CUL's promise of delivering "a real business experience" as discussed in Chapter 1.3. It was clear that there was a greater likelihood of technology acceptance and subsequent use if the technology was perceived to be useful in enhancing employability. There was a great deal of positivity evident regarding the importance of learning technologies being designed to be able to be transferred into future employment.

Although there is limited literature on the correlation between technology acceptance and its effect on student employability: for example, James et al.'s (2006) article on the need for educators to discover how to maximise the potential of PowerPoint (due to its influence on student employability) and research projects at the universities of Greenwich, Reading, University of Arts London (JISC 2013b) and Oxford Brookes (2018), this thesis has confirmed that employability is perceived to be a major factor in influencing technology acceptance. Moreover, it is asserted that Kambiko and Mawer's (2013) and Langan et al.'s (2016) arguments that modern-day students see education more than ever as inherently linked to their future career particularly holds weight in this thesis. This finding echoes the recommendations of JISC (2017b) and Beetham (2015) discussed previously who maintain the importance of instilling practical digital skills in graduates so that they are able to better perform in the workplace. This is currently not taking place at CUL and possibly at other institutions to the required level and is certainly an area that can be improved upon. This point was acknowledged by Senior Manager D. However, the other four senior managers did not mention the importance of utilising learning technologies in order to enhance student employability. This discovery perhaps gives greater credence to why only half of UK HE students believe their courses prepare them appropriately for the digital workplace as articulated by JISC (2017b: 1).

These findings have a number of implications for the university's current pedagogical strategy and the resultant delivery of lectures and seminars by academics. It is evident that students welcome the inclusion of learning technologies that they perceive to be helpful in attaining and excelling in future employment. These transferable skills were viewed to be both valuable and motivating. As a result, it is suggested that CUL invests in pragmatic applications that enhance employment prospects. These applications should still include existing practical applications such as PowerPoint, Word and Excel as well as interactive software (such as ARS and simulations) that students can use and practice in order to engage future colleagues/clients and perform to their potential in a digitally-mediated, uncertain and "disruptive" future as articulated by Beetham (2015).

Exploiting the potential to improve employability through TEL will require a shift in the university's current rather ad-hoc educational strategy and necessitate the creation of a coherent policy and subsequent academic training programme that focuses on embedding employability more deeply and consistently into the curriculum. This change of approach will also require greater involvement by academics in their continuous professional development as argued by Beetham (2015). I will discuss my solutions to this issue in more detail as well as how the university and wider HE can better engage with employers in the recommendations section in Chapter Eight.

The enhancement of IT literacy was another variable that had an impact on technology acceptance in students.

7.1.1.3 Enhancement of IT literacy

The perceived positive effects on the enhancement of IT literacy was found to be another influential factor in facilitating technology acceptance. This finding is aligned to relevance to future career as discussed above. It was interesting that the vast majority of students stated that they were unfamiliar with a number of the technologies they were introduced to at the start of the course (some had not heard of Moodle for example) although they gained more confidence in using them as the course progressed. The thesis discovered that students were pleased that they were able to learn new skills and improve their inventiveness with IT in the process. The creative element of students possessing the autonomy to invent their own activity based on the content introduced in class was discovered to be popular for two reasons; focus, and improving teamwork between different nationalities. This suggests that many students prefer personalised learning and collaborative learning environments as discussed in Chapter Two.

Perhaps unsurprisingly, the study illustrated that certain academics were perceived to be more proficient and effective in teaching IT skills when compared to other colleagues. The interviews and focus groups revealed that students believed there was an actual consolidated approach to the usage of technology although each academic had their own way of doing things. Students perceived this approach in rather general terms such as using IT to increase student engagement although the intricacies of a perceived unified and consistent pedagogical strategy were not articulated or discussed by any student. Technology was seen throughout the data collection process to be a conduit in enhancing interaction and communication between peers. It was interesting that students were able to identify that each academic had their own individual teaching style with some lecturers perceived to be more adept and confident using technologies than others. Further, it was noted that students wanted academics and learning technologists to teach them how to use and apply specific applications. This finding may also suggest that it would be useful to build time into the curriculum for students to become familiar and comfortable with these technologies. The apparent inconsistency in academic capability using learning technologies was not seen to be a particular problem, as students generally enjoyed the different approaches that were employed although there was a common finding in that students were introduced to the exact same technologies analysed in the literature review. Students did not experience and apply anything perceived to be new and innovative. However, academics were not criticised for this apparent weakness as in Selwyn’s (2016) study where students were unhappy with academic incompetence using learning technologies. Instead, the lack of creativity appeared to foster more confidence in students. This situation actually correlates with the recommendations made by Senior Managers A and B who both emphasised the importance of students and academics having a consistent experience with the recommendation that a few selected technologies should be used throughout the student learning journey. These results can be connected with Chowdhry et al.'s (2014) findings who discovered that students possessing the requisite knowledge and experience of how an online learning environment operated were more comfortable and enthusiastic in using VLEs than students who did not possess the same level of experience. Confidence in one's ability to effectively utilise various forms of technology had an impact on student enjoyment and their overall experience on a course.

Enjoyment was found to be another factor in facilitating technology acceptance.

7.1.1.4 Enjoyment [hedonism]

The thesis discovered that students enjoyed the competitive nature of quizzes and the resultant collaboration with classmates. The hedonistic nature of ARS was also seen as a significant factor in encouraging student technology acceptance. This finding aligns to Blanco and Ginovart's (2012) study who discovered that quizzes (Moodle quizzes in this case) were an effective pedagogical strategy in encouraging a fun, competitive and interactive classroom atmosphere. The students in this study all embraced the hedonistic capabilities of learning technologies. For instance, YouTube was seen by students to be useful in making classes more engaging and as an interesting interlude between imparting lecture and seminar content. Students enjoyed the variety of techniques employed by various academics and found them useful in focusing them on the subject being taught. This finding correlates with Conole and Alevizou's (2010) study who affirm that YouTube particularly appeals to visual learners who enjoy watching interesting and thought-provoking content.

The research discovered that the actual enjoyment of partaking in interactive learning technologies had a significant impact on the decision to accept. The competitive nature of quizzes and group competitions were very popular. Students also enjoyed making their own content and being judged against others. This pedagogical strategy was able to improve collaboration and socio-cultural learning as discussed in Chapter Two.

Indeed, the ability of learning technologies to produce an entertaining and hedonistic experience was commonly seen as useful in increasing student satisfaction, improving the student experience and focusing students on the task at hand. This approach was viewed as a positive new experience when compared to previous learning experiences in other universities, which tended to be less interactive in comparison. Unsurprisingly, technology was found by students to possess the capability to increase enjoyment due to its interactive nature. Students believed this component made lessons more enjoyable and more attractive to attend; particularly if the academic had previously used the same or another form of technology to generate a positive classroom atmosphere. It was found that seminars tended to be more enjoyable and more attractive to attend than lectures as the latter was generally delivered one-way, often with limited audience participation.

These findings align to the HMSAM framework as hedonism in this instance was used to satisfy individual intrinsic motivations (Lowry et al. 2013). These intrinsic motivations were found to be grounded in flow-based cognitive absorption as argued by Lowry et al. (2013) as students were able to enjoy a fun, deep and meaningful experience via the use of learning technologies. Although hedonism was discovered to be a useful variable in facilitating technology acceptance in students, the relationship was nevertheless not as impactful as the link with employability and to a lesser extent the enhancement of IT literacy. Moreover, it was revealed that students welcomed the use of learning technologies (such as ARS) albeit in moderation. This is because certain lecturers tended to use popular technologies (such as Kahoot) on a regular (weekly) basis. This was observed to be a form of “overkill” and lessened the impact these applications had. Therefore, these results demonstrate that learning technologies are capable of delivering a positive and enjoyable classroom atmosphere provided that they are used in a personalised way and particularly in moderation in order to maximise their impact. The competency of the academic and their mastery and understanding of pedagogy are both important factors in enhancing the classroom atmosphere.

The discussion on PU continues in the next section and focuses on specific variables that influence technology acceptance in academics.

7.2 PU in academics

Two variables were connected to influencing PU in academics - Job relevance and Technological, Pedagogical and Content Knowledge (TPACK). As will be discussed below, these variables were both found to be extremely important in facilitating technology acceptance.

7.2.1 Job relevance

Job relevance was discovered to be a particularly important variable affecting technology acceptance throughout the whole data collection process. For instance, several academics believed that embedding learning technologies into their delivery was a useful strategy in giving greater autonomy to students: an approach they thought was especially relevant to an academic's job as this strategy was able to support students in improving both their confidence and subject cognition. This finding supports Roca and Gagne's (2008) study who elucidate the importance of building student motivation and confidence by providing greater autonomy.

In addition, other academics stated that the use of learning technologies was able to help students focus on a subject more effectively than if the content was solely delivered in a one-way fashion, aligning to the arguments of Kay and LeSage (2009) and Clifton and Mann (2011). Technology was discovered to be helpful in facilitating learning and making large lectures and seminars more interesting to teach and more motivating for students to attend. The inclusion of technology in a class was also seen to make an academic's job more enjoyable and less stressful when it succeeded.

Furthermore, the thesis established that technology was perceived to be relevant to an academic's role as it simplified teaching to international students (the main student population at CUL) who spoke English as a second language. In this respect, the use of technology (such as PowerPoint) was seen as a helpful strategy to clarify information at first-hand; by offering examples and allowing students the opportunity to check on the VLE at a later juncture had they not understood on the first occasion.

The use of the VLE was found to be a convenient resource for both academics and their students and as an important tool in communicating effectively. Academics expressed content that they could contact students at any time through the VLE. Moodle was viewed as particularly helpful to their role due to its portable nature and ability to be used on many devices. These findings add confirmation to Alharbi and Drew's (2014) study who discovered that job relevance contributed to the PU and PEOU of the LMS which ultimately resulted in a positive attitude toward usage and behavioural intention to use.

It has been suggested that if academics fail to support the use of an LMS (such as Moodle) it may have serious consequences on whether it can be a successful part of the student learning experience (Dlalisa 2017). Fortunately, the academics in this study were mostly in support of Moodle due to its advantages in increasing efficiency and making their jobs easier. Moreover, these results add gravitas to Venkatesh and Davis' (2000) study, which found that job relevance and output quality have a moderating influence on PU. This is because the higher the quality of the output, the more powerful the effect job relevance had on PU in the academics who were interviewed.

Social media (such as Facebook and Twitter) was also seen to be useful and relevant to an academic's role when communicating with students, backing-up the arguments of Junco et al. (2012). The ability to answer questions and give feedback was popular with both academics and students, with the PU of this strategy highlighted as a significant factor in improving student satisfaction. However, although several academics viewed technology as a valuable tool in facilitating interaction and in ultimately making their jobs easier, others delivered the caveat that too much technology (such as the over-usage of videos) can lead to monotony and be ultimately detrimental to learning. This suggests, as above, that technology can be an effective tool for both students and academics, providing it is used appropriately and in moderation.

Technological, Pedagogical and Content Knowledge was another factor viewed by academics as an important influencer in technology acceptance.

7.2.2 Technological, Pedagogical and Content Knowledge

The thesis confirmed that academics possessed a general lack of confidence regarding learning technologies, which negatively affected their ability to include them in their pedagogical practices. To some extent, this finding correlates with the arguments of Hartshorne et al. (2005) and UCISA (2018) who discovered that teachers often lack the ability to effectively embed technology into the curriculum. However, the academics in this study believed that they had a sufficient general level of technological knowledge to deliver interactive classes although there was a lack of confidence regarding their competence to deliver innovative and up-to-date techniques. As mentioned above, this lack of innovation and experimentation was evident in the lesson observations throughout the two-year period with many academics seemingly content to use the same learning technologies and regurgitate existing pedagogical approaches. There appeared to be both a lack of confidence and knowledge in practicing and delivering new learning technologies. Most academics believed that they were competent with technology and students did not expect them to be proficient. However as discussed above, this perception was found to be incorrect. There also appeared to be a reluctance to experiment with new ideas in case unfavourable student feedback was received. There was a common agreement that although lessons should be fun in order to promote attendance and enhance learning, the most important output was the achievement of learning outcomes.

There was an acknowledgement that academics tended to utilise common techniques and did not go beyond minimum student expectations due to a number of reasons. These included prioritising other duties, not having the knowledge or confidence to experiment and fearing reprisals should something not work as expected. Nonetheless, there was agreement that the use of technology was an effective pedagogical practice due to its relevance to the generation of students being taught and that it made classes more interesting. Academics realised the importance of contextualising and personalising technology usage in the classroom. It was also discovered that technology integration should be combined with “traditional” teaching techniques such as scaffolding vocabulary, role-plays, presentations, learning checks and pair and group work activities. Indeed, the benefits of using technology to check learning was viewed as a particular advantage by several academics.

The majority of interviewees were all positive regarding the effectiveness of appropriate technology, pedagogy and related content being employed in achieving module learning outcomes although there was an acknowledgement that technology by itself was not a panacea in improving student engagement, performance and progression. There was a consensus that technology was a useful tool to help learning take place.

There was also the belief that learning technologies can be used to help students who are struggling to keep up in class by simplifying and clarifying content through quizzes, showing videos and building confidence by facilitating understanding through collaborative activities. In addition, the versatile nature of technology allowed academics to “push” more capable students by giving them autonomy and responsibility when collaborating with less confident or able classmates. The ability to utilise technology in this way was seen as an advantage by several academics who were able to stretch students to reach the upper evaluative echelons of Bloom’s taxonomy (Bloom et al. 1956). However, it should be acknowledged that only a few academics made this claim.

Other academics believed that technology was an effective enabler in the creation and delivery of student-led seminars and student-led quizzes (after students were coached on what to present) which were able to further promote autonomy and increase engagement in seminars. These results can be connected to the findings of Patry (2009); Kay and LeSage (2009) and Licorish et al. (2018) who are all proponents of ARS in facilitating greater student engagement. Unlike the JISC (2017b) study which discovered 48.4 per cent of UK HE students have never used ARS before, this form of learning technology was used frequently and generally successfully in CUL.

Other academics commented that it was important to use technology to deliver relevant and up-to-date content for students. For instance, it was seen as important that flipped classes contained unique content that was both interactive and engaging and were not repetitive in any way. Unfortunately, the data collection process indicated that this was not the case at all.

It was also interesting that one academic used technology as her individual “unique selling point” as she believed it was important for her to demonstrate to students (some of whom were of a similar age) that she possessed the same level of technological knowledge in order to relate to them as a ‘Digital Native’.

The results above can be associated with the findings of Abbitt (2011: 134) who claims it is both important and complicated for teachers to keep up with technology due to it being a ‘moving target’ and continuously advancing. As discussed, it was clear from the interviews and lesson observations that there was a lack of innovation evident and a reliance on using the same technologies over a sustained period of time. Academics admitted that although they had some knowledge of using technology as part of their pedagogical practices, they were nevertheless unconfident using new learning technologies. These results give greater weight to the findings of Ertmer and Ottenbreit-Leftwich (2010: 261) who assert that self-effectiveness beliefs, knowledge of technology and understanding of cultural contexts on technology integration are all vital components although ‘knowledge of technology is necessary, it is not enough if teachers do not also feel confident using that knowledge to facilitate student learning’. There was most certainly a lack of variety in the technologies used by the academics in the study correlating to the arguments of Cuban (2001: 134). Furthermore, as Mishra et al. (2010) postulate, the apparent lack of technological knowledge possessed by each academic was a major barrier to its integration in the classroom. Minimal experimentation and a lack of willingness to deliver innovative technological pedagogical practices were displayed throughout the data collection process. Moreover, as Harris et al. (2009) assert, it was discovered that teachers needed to be familiar with more than the technical aspects of technology and to be able to understand its strengths and weaknesses in presenting engaging content and its relevance to specific pedagogical approaches. This was another area that was visibly lacking in the lesson observations with all of the academics observed content to use established technologies. The lesson observation forms (see appendix 11) contained little justification for the choice of particular technologies within the lesson.

The academics interviewed in the study agreed with the arguments of Ertmer and Ottenbreit-Leftwich (2010) who elucidate that teachers from 20 years ago could be regarded as effective practitioners without implementing technology in their classes, although expectations today are very different. It was discovered that technology is needed in modern UK HE due to its benefits in meeting the learning needs and expectations of international students. However, it was not easy to evidence consistency in the lesson observations as some academics were confident and proficient using technology in their teaching whereas others were not.

The study confirmed the findings of Koehler and Mishra (2005) and Wetzel et al. (2014) who contend that, although there has been a great deal of research on what teachers need to know about learning technologies, there has been little attention paid on how they are able to learn about it. The lack of training and clarity from the university regarding its pedagogical strategy involving learning technologies arguably contributed to this issue. Training tended to be haphazard, rare and unfortunately very few academics attended. The need to create a cohesive and targeted pedagogical strategy that addressed the learning needs of students and the resultant professional development needs of academics was a key finding from the data collection process.

Moreover, the study confirmed, to some extent, Ertmer and Ottenbreit-Leftwich's (2010) arguments that technology embedded in classes is not particularly engaging nor innovative despite teachers purporting to be "tech-savvy" and proponents of Constructivist and student-centred learning practices. This thesis has established that technology can be engaging and useful if it is targeted and personalised to student learning needs and academics are confident in its delivery. The academics interviewed in this study did not categorise themselves as proficient with technology and merely competent in its use from a pedagogical standpoint. Each respondent was honest about his/her shortcomings and their need to improve.

The research however, does arguably confirm Ertmer and Ottenbreit-Leftwich's (2010) study that it is essential for teachers to be able to use technology to create meaningful experiences that can be applied to real-life scenarios in order to improve student employability. This is viewed as necessary yet challenging to accomplish due to the potential need to change teaching beliefs and pedagogical styles. The thesis also agrees with Ertmer and Ottenbreit-Leftwich's (2010) arguments that teachers tend to be reluctant to embrace technological change due to its constantly evolving and ephemeral nature.

A lack of technological knowledge, previously-held pedagogical beliefs as well as issues such as a lack of institutional support and time constraints have hindered academics' adoption of technology at CUL. These findings confirm that the potential of technology is still yet to be realised as discussed by Kirkwood and Price (2013) and Englund et al. (2016).

The next section focuses on PEOU.

7.3 Perceived Ease of Use

This section is also separated into two areas: PEOU in students and PEOU in academics.

7.3.1 PEOU in students

Two variables (Nationality and Familiarity with technology) were particularly associated with PEOU. PEOU was found to be less influential when compared to PU in facilitating technology acceptance in students. It was interesting that students did not adhere to the arguments of Venkatesh and Davis (2000) who discovered that PEOU was more effective and attractive than PU, with PEOU seen to have a mediating effect on PU. Although PEOU was a factor, PU was influential in facilitating technology acceptance, endorsing the findings of Straub et al. (1997). As they state, this finding may be due to PEOU becoming less important over time as well as PEOU possessing more of an indirect impact on deciding to use a particular technology (as it influences the PU of a system or media).

The impact of nationality on technology acceptance is analysed in the next section.

7.3.1.1 Nationality

The research demonstrated that nationality does have an influence on technology acceptance although the relationship is not as impactful when compared to other variables. Due to the vast numbers of Chinese and Nigerian students at CUL, these nationalities were discussed most prominently in both the interviews and focus

groups. The research uncovered that certain nationalities were perceived to be more proficient than others although there was a disagreement regarding the IT literacy of Chinese students. For instance, several respondents commented that Chinese students tended to be weaker with technology when compared to other nationalities and were less likely to use technology as a result. A further claim was made by other interviewees who remarked that language difficulties and a reluctance to mix with other nationalities contributed to Chinese students not participating in technology-based activities. This finding is linked to Hofstede's (2001) cultural dimensions framework, which demonstrates that Chinese people have a high degree of collectivism and prefer to work in groups rather than as individuals. Moreover, this research confirmed the findings of Issa (2014) who posits that Chinese students tend to be collectivist in their learning style and can be passive and observational when participating in class. As in Issa's (2014) study, the students in this research process generally adopted a Confucianist approach when it came to using technology in their studies. They also tended to lack initiative when compared to other nationalities and were content to observe and not question the relevance and validity of the technology being used. As Straub et al. (1997) suggest, a low level of individualism such as this, can reduce technology acceptance. This is because people from collectivist societies (such as China) are often unable to clearly understand cues regarding social situations from computer-based media when compared to those from individualistic societies who are generally able to attain a deeper and more sophisticated understanding. However, it can also be asserted that this issue may be more complicated and perhaps more connected to the working preferences of Chinese students rather than their acceptance or non-acceptance of technology.
On the other hand, Chinese students were viewed by other respondents to be confident and effective when using technology. There were a number of positive comments made regarding their knowledge about technology and their capability when compared to other nationalities. These comments were supported by the lesson observations where a number of Chinese students had little or no difficulty in using technology in the classroom. Therefore, the effect of nationality on technology acceptance from a Chinese perspective is unclear.

However, Nigerian students were perceived to be less proficient in using technologies and were therefore less likely to accept and use them. Nigerian students tended to take longer to understand technologies in the lesson observations. There was a common perception that Nigerian students, unlike Chinese learners, had little exposure to technology before coming to CUL meaning that they often struggled to participate to the same level as other nationalities. These findings are slightly different to Hofstede’s (2001) study on uncertainty avoidance that gave Nigeria a score of 55 (which does not demonstrate a clear preference). Instead, this thesis discovered that Nigerian students were generally uncomfortable with ambiguity and in uncertain situations. It can be affirmed that this finding could affect technology acceptance in Nigerian students, as they may favour traditional forms of media (i.e. they prefer to use media that they know) rather than computer-based media which they may not have used before. Furthermore, Media Richness Theory as articulated by Balaji and Chakrabarti (2010) can also be associated to this issue. For instance, for complex tasks, students may decide to use rich channels (such as face-to-face discussions) whereas for tasks that are less ambiguous and uncertain, simpler channels (such as email) may be selected.

It also should be discussed that several students believed nationality was not a significant factor in influencing technology acceptance. For example, it was stated that acceptance may be more related to the respective communicative ability of the student with others believing that each student should be judged individually, irrespective of nationality. Nonetheless, there was support for Levy’s (2007) assertion that learning technologies play an important role in improving the quality of communication between nationalities although perhaps not to a great extent. Indeed, Levy’s (2007) affirmation that learning technologies are able to act as a conduit in engaging various nationalities in the same lesson content was not discovered to the same degree in this thesis. There was also little connection with Langan et al.’s (2016) research on using technology for non-studying purposes and link to nationality. The students in this study knew using their mobile phones for non-studying purposes was against the university’s policy although they admitted doing so regularly despite being told not to by their teacher. A lack of respect for the university’s rules and the teacher was evident although it was clear that not one nationality was guiltier than another with all students participating to an extent. On the other hand, Langan et al.’s (2016) findings that the integration of learning technologies has remained almost the same for many years with very little attention paid to cultural considerations was identified in this thesis with the academics interviewed and observed seemingly content to continue to use the same strategies in their teaching toolkits.

For students, in terms of the types of technology that was used, some were more accepted than others. For example, checking emails in class (provided it was of a short duration) was tolerated and not seen as an overly troublesome activity. On the other hand, checking Facebook for a sustained period of time, playing games and watching online content was viewed in a more negative way. The students who admitted to these indiscretions did so because they were bored with the lesson. However, other students saw brief diversions from the lesson content as a positive aspect and not overly detrimental to learning. This finding resonates with Langan et al.'s (2016) study which discovered that brief interludes with emails and Facebook is actually seen as a quick mental break that can improve concentration for the rest of the class. However, it was also acknowledged that several students understood that these actions were distracting and as long as other students were not distracted they could choose to do as they wish with their own time, especially as they were the paying customers. Again, no particular nationality was found to be worse than others.

Respect was seen as an issue with many students trying to hide their activities in order not to irritate their teacher. Nonetheless, several students said that they could not help being distracted by technology as it had become a force of habit with others stating that having technology in front of them (such as having access to the internet) was too tempting, making it difficult to concentrate on the lesson topic. As Langan et al. (2016) discovered, academics were viewed as primarily responsible for classroom engagement with little acknowledgement of the student's role in the process. Indeed, academics were generally seen as employees to the students as they had paid for their services. Once more, this issue was not found to be predominant in any specific nationality.

The next section of the thesis will investigate student familiarity with technology.

7.3.1.2 Familiarity with technology

The results demonstrated that students saw popular technologies (such as PowerPoint) as comforting due to their familiarity. This variable is arguably linked to the nationality section above with the majority of students stating that they had not been introduced to most of the learning technologies implemented on their programme until coming to the UK. It appeared that student expectations were based upon their previous learning experiences as asserted by Margaryan et al. (2011). The lack of familiarity with new applications made certain students apprehensive, at least initially, about accepting and using technology. Furthermore, students from Vietnam and India were used to relatively basic technologies before coming to CUL. These students found the amount of technology and sophistication to be initially overwhelming, especially in Term 1 of their course. On the other hand, other students stated that they were familiar with several of the technologies they were introduced to as they had similar experiences in their home countries. However, they were not exposed to technology to the same extent that they were at CUL. Indeed, it was surprising that one student had not experienced PowerPoint before coming to the UK. Interestingly, the students interviewed in this thesis agreed with the findings of JISC (2017b) when contending that they were unlikely to contact their teacher if they needed support with an IT issue. Instead, they had greater confidence in the learning technology team to help them.

7.3.2 PEOU in academics

Academics were more influenced by PEOU with four variables associated (Priorities, University support, Anxiety and Past experience). This discovery suggests that academics are more focused on how straightforward a technology is to use rather than how useful it is to themselves or their students.

Priorities and their relation to technology acceptance are evaluated below.

7.3.2.1 Priorities

The thesis found that academics had difficulties prioritising the use of technology with other duties taking precedence. For example, one academic stated that lesson preparation time was most important with the acquisition of new technological skills seen as onerous and time-consuming, particularly without a recognised support system being in place. This finding correlates with the studies of Laurillard (2002); Hartshorne et al. (2005); Beetham (2015); Justice and Ritzhaupt (2015) and Laurillard (2015) who assert that the lack of time provided to teachers by institutions often acts as a deterrent in integrating technology into pedagogical strategies.

In addition, other academics believed that the time needed to set-up technology in class was often unnecessarily long due to challenges with the stability of the university's Wi-Fi connection in line with Selwyn's (2016) study on issues associated with internet connectivity. This compelled one academic to prioritise imparting content, using a more traditional "one-way", Instructionist form of delivery. Similarly, another academic recognised the usefulness of technology in engaging students although remarked that it was often difficult to prioritise the time to research and practice new technologies with other tasks (particularly lesson preparation) being more of a priority. Another academic stated that she was unable to implement technology as frequently as she wished due to the need to complete other duties such as marking and curriculum design first. These issues all suggest that academics were generally unable to effectively prioritise the use of learning technologies in their teaching toolkits. It was also discovered that some academics had researched into implementing learning technologies into their lessons (such as attending learning technology conferences on their own volition) although they had not been able to practice what they discovered due to the busy nature of their positions.

The above discoveries are connected with Mumtaz's (2000) findings who asserts that other priorities can inhibit academics from engaging with technology research. Similarly, the results echoed Hartshorne et al.'s (2005) study, which observed that there were numerous problems associated with teachers and their effectiveness using learning technologies. The lack of academic expertise with learning technologies stemmed from the ineffectiveness of standalone teaching technology courses offered by the university with workshops viewed to be particularly ineffective. These negative experiences were transmitted to other academics which subsequently impacted on attendance at future events.

Although not the most impactful external variable, priorities such as those discussed above nevertheless negatively influenced technology acceptance in academics and resulted from a lack of confidence in the university support that was provided.

7.3.2.2 University support

It was revealed that there was an expectation by the university for its academics to implement learning technologies inside and outside the classroom in order to provide clear communication and engage students. However, it was evident that there was no clear strategy and it was left up to individual academics to decide in what way they would embed TEL into the curriculum. As mentioned above, there were no formal training sessions organised and the sharing of ideas tended to take place on an informal and ad-hoc basis. This finding resonates with Hartshorne et al.'s (2005) study on the ineffectiveness of irregular and unstructured workshops offered by HEIs. The lack of clarity regarding the university's strategy on the use of technology as well as the ad-hoc nature of the information that was shared, negatively affected technology acceptance in academics who saw this as a lack of targeted support as articulated by Mumtaz (2000). The thesis confirmed the arguments of Lai and Smith (2017) who suggest that, despite considerable investment, there is a perception amongst many academics that universities do not offer a clear and robust support strategy. For example, one academic acknowledged that she needed to use technology as that was what the university expected, although she was unsure what to use and how frequently. Another academic was particularly critical of the university's support and thought that there was no real strategy in place.

The lack of specific university support regarding training and having enough time to research about technology's impact as part of an integrated pedagogical approach was instrumental in influencing academic acceptance. As discussed above, the pressure to achieve high levels of student satisfaction created greater anxiety in the academics interviewed. Although they were aware of the need to produce high quality lessons as professionals and to help the university progress, the lack of guidance and understanding about how to create an effective technology-infused pedagogical strategy was viewed as generally demotivating.

Although there are now many possibilities to incorporate technology into teaching (Scardamalia 1996: 149), it was discovered that the actual benefits of learning technologies were not yet properly understood by the academics who were interviewed (Salmon 2003: 12; Kirkwood and Price 2005: 265). Considering the substantial investment that has been made by CUL, this finding is rather disappointing. Like its competitors, CUL has invested in several technologies to maintain student expectations and increase the quality of its offerings (Walker et al. 2014). Investments have been made into areas such as online assessment, plagiarism detection (Baker et al. 2011), blogs (Churchill 2009), e-portfolios and online collaborative tools (Ackermann 2004; Warburton and Perez-Garcia 2009) although unfortunately not with the effect it was hoped for. Indeed, CUL has not been able to flourish with its learning technologies provision to the extent extolled by Walker et al. (2017: 4) who states that HEIs have created prime conditions in which pedagogical innovation can flourish. However, the primary research does not support the statement made by BETT (2018) who claim a lack of institutional support is widespread in UK HE. The willingness to support is arguably in place at CUL although there is a lack of a coherent pedagogical strategy that is required to drive the institution forward.

The impact of anxiety on technology acceptance is now examined below.

7.3.2.3 Anxiety

Although not the most influential variable in influencing technology acceptance, computer anxiety was moderated by experience when using a particular learning technology, meaning it was more related to PEOU. For instance, one academic was compelled to implement technologies in class (despite not always having confidence in how to utilise them properly) as the institution had made it clear that they had made a great deal of investment into their use. This situation induced anxiety as this academic had to spend a considerable amount of time modifying her lesson plan by building in further TEL activities, correlating to Davis' (2003) study on higher workloads increasing stress in academics.

On the other hand, different academics believed that the nationality of the student was often associated with their expectations with those exposed to technology in their home countries seen as capable of inducing greater stress, due to being more demanding than students with less exposure who would be generally easier to please. It was also stated that nationalities with limited experience with technology could create greater anxiety in academics. For instance, one academic commented that certain nationalities gave him more anxiety than others with African students seen as particularly stressful to teach due to their perceived lack of technological awareness. Another academic made similar comments regarding Nigerian students and remarked that their lack of prior experience with technology could often make classroom teaching problematic due to the amount of explanations and demonstrations that were sometimes required. Academics had difficulties in keeping the rest of the class engaged whilst these students received extra support. This situation added to academic anxiety.

In addition, it was discovered that TEL did not work at all with certain nationalities. For example, Chinese students occasionally increased anxiety and stress in academics due to their perceived lack of responsiveness and interaction in class. The use of technology in this instance was seen as unhelpful in facilitating greater interaction. It was also noted that academics who used technology and subsequently struggled to engage certain nationalities would hesitate to persevere or experiment with new technologies in the future. Previous negative experiences were seen to have an influence on current technological engagement. More traditional teaching approaches (such as delivering one-way lectures and using case studies in seminars) were seen as less adventurous although at the same time potentially more effective (and less time-consuming to organise). Academics tended to fall back on less interactive techniques as they were perceived to be easier to use and less onerous to prepare and implement. This strategy reduced the possibility of anxiety occurring. However, the thesis found that all academics felt anxiety (and in some cases embarrassment) when the technology did not work and they had to improvise with spontaneous solutions in front of students.

It was also observed, at least to an extent, as Venkatesh and Bala (2008) posit, that computer anxiety on PEOU lessened after positive experiences of technology usage were accrued. These experiences tended to occur with the same technologies although when academics used unfamiliar packages, computer anxiety increased. The lack of an intervention mechanism by the university (such as the absence of a formal training programme or evaluation of the technologies that were used) often exacerbated computer anxiety in academics. However, it should be acknowledged that the majority of academics interviewed were generally confident with more established technologies (such as PowerPoint and Moodle) although when faced with the prospect of embedding new technologies for which they were not familiar, anxiety tended to rise, leading to lessened technology acceptance. This finding was common in most academics although a small majority were quite open to experimenting, providing they had the time to research how an application worked in practice as well as having an understanding of its perceived pedagogical benefits.

There was a fear that experimenting without receiving sufficient training may lead to reprisals from line managers if students gave negative feedback. This perception tended to dissuade academics from trying out new techniques and to persevere with less innovative and more established teaching strategies.

Moreover, GDPR compliance was found to be a factor causing anxiety with academics unsure of what technologies they were able to utilise in their classes without receiving serious repercussions from the university. This situation made academics hesitant to experiment with new software and resort to more traditional and often less interactive delivery methods.

The final external variable influencing PEOU – Past experience – will now be discussed.

7.3.2.4 Past experience

Past experience was also discovered to have an influence on technology acceptance in academics. For example, PowerPoint was seen by academics to be an integral tool that can be used in classes to enhance delivery, contradicting the arguments of Selwyn (2016) who criticises this form of technology as unadventurous and uninteresting. Furthermore, ARS were seen by teachers to be an engaging platform that could be used to create a better and more interactive atmosphere for students, correlating to the studies of Kay and LeSage (2009); Gauci et al. (2009); Patry (2009) and Licorish et al. (2018). Successful past experiences with ARS gave greater confidence that they would produce similarly positive results in the future. VLEs were viewed as generally useful in improving communication and organisation as affirmed by Henderson et al. (2015); Bower and Wittman (2011); Novo-Corti et al. (2013); Deng and Tavares (2013) and Steffens (2008). On the other hand, if a negative experience occurred, academics tended to have less confidence about applying the same techniques in the future. The findings for simulations demonstrated the same opinions with the decision to continue using a particular technology dependent on the past experience being positive or negative.

The interviews confirmed that academics who enjoyed previous successes with technology were also more likely to repeat the same strategy with different cohorts. Conversely, those academics who had struggled with technology or found it difficult to achieve expected results both at CUL and at past institutions were more hesitant to accept technology and engage with new research.

However, there was some evidence of Selwyn's (2016) findings, which discovered that students had an overall negative perspective regarding their teacher's ability to use technology appropriately and effectively and were unhappy with distractions caused by teacher incompetence.

On the other hand, there was no correlation to the findings of Lai and Smith (2017) who discovered that female and less-experienced teachers were more likely to accept and use technology in the classroom when compared to male and more experienced colleagues. The academics in this study (male, female, experienced and relatively inexperienced) all contributed to the results detailed above. None of these categories displayed any significant differences.

Recommendations from learning technologists for the issues articulated above will now be discussed in order to provide solutions for both students and academics.

7.4 Recommendations from learning technologists

The learning technologists concurred that there was a lack of direction from senior management. This resulted in both frustration and confusion for the learning technologists who were unable to contribute to a unified and clear strategy.

The recommendations from the focus group with the learning technologists can be broken down into two main areas: the importance of creating best practice (so far with limited success) and the need for improvement in institutional direction.

7.4.1 Creation of sustained best practice

The learning technology team explained that they had attempted to create a best practice delivery and their offerings included one-to-one sessions for both students and academics who were able to be trained on a particular technology by request. Workshops focusing on common themes were also created although they unfortunately tended to be sparsely attended. The learning technologists were unsure how to improve this issue and acknowledged attendance at such events may be influenced by other commitments such as marking and teaching. One suggestion was to make workshops compulsory and related to CPD although they were unsure how to make this happen. It was also suggested that CUL should attempt to improve the IT literacy of its employees by conducting specific training programmes as part of a wider technology-infused pedagogical plan. This strategy will arguably be able to improve the skills of academics and ultimately the learning experience for students as discussed by Porter et al. (2014) and JISC (2017c).

7.4.2 Improvement in institutional direction

This issue was seen to be in most need of attention with each learning technologist admitting that they had no idea about the university’s pedagogical strategy regarding learning technologies and that they usually acted as they thought most appropriate, often in an ad-hoc manner. “We lack institutional direction” was a common theme discussed in the focus group with words such as “frustrated” and “stressed” used to describe their predicament. They believed that a major reason for the failure of their workshop delivery was due to a lack of a cohesive strategy being in place. They found it frustrating that they were unable to “get people together” for staff development purposes. They stated that one-to-one sessions were more successful although were very time-consuming and perceived to be not the most appropriate use of their time and resources. These sessions were also seen to be lacking in coherence, as they were usually one-off workshops and not part of any co-ordinated strategy. The learning technologists also believed that those who attended these sessions already tended to be quite proficient and motivated to use technology whereas those who did not attend were more in need of support. Not being able to help these individuals was viewed as a source of frustration. They hoped that those who did attend would spread the message by positive word of mouth to their colleagues although they wanted a more structured strategy in place that was able to effectively develop the IT skills of both academics and students.

It was clear that the vast majority of academics at CUL did not adhere to Laurillard's (2013) recommendation that it is vital to keep up-to-date with learning technologies so that they can fulfil the learning requirements of the students they teach. Arguably, until the institution creates and implements a suitably robust policy that provides solutions to the issues elucidated above, this situation will continue to be unchanged and the ability to effectively implement learning technologies will not be properly maximised as discussed by Salmon (2003: 12) and Kirkwood and Price (2005: 265).

7.5 Perspective from the institution

The institutional perspective was uniform in that there was consistent agreement between the five interviewees who extolled the importance of optimising the quality of the student experience through learning technologies. However, it was also evident that there was no clear agreed strategy in place with Senior Managers recommending that academics continue to experiment without providing them with a framework for doing so. Although the recommendations were well intentioned in that a selected number of learning technologies were advised to be embedded into the curriculum (in order to make learning and delivery specific and manageable for students and academics) there was a lack of cohesion on how this plan would take place. For instance, the specific number, type of learning technologies and their desired outputs were not discussed. Moreover, there was no thought given on criteria to select these platforms and applications and how they would keep up with the ephemeral nature of technology. It appeared that there was a great deal of concern regarding their effectiveness in enhancing the student experience from a holistic perspective although scant consideration was given on how technology could be used to improve student learning gains (such as enhancing employability skills). Only Senior Manager D acknowledged the importance of this provision. The focus was more on overall student satisfaction rather than tangible student outcomes. The research discovered that the effectiveness of technology in connection to student learning could be improved as articulated by Clarke et al. (2001).

The culmination of this analysis has resulted in the creation of “The Student and Academic Technology Acceptance Model”. This is examined and evaluated below.

7.6 Introduction to the Student and Academic Technology Acceptance Model

As has been previously discussed and justified, TAM’s structure has been applied in this research in order to ascertain what influences technology acceptance in students and academics at CUL. The Student and Academic Technology Acceptance Model (SATAM) has emerged from this research and focuses on specific external variables that influence PEOU and PU. This conceptual framework has been developed as a result of the CGT process and is formed from specific aspects of the literature review in Chapter Two and the technology-based theories introduced and evaluated in Chapter Three. As will be subsequently discussed, SATAM is argued as a more up-to-date and integrated version of TAM that specifically focuses on technology acceptance in students and academics. It was discovered, as the literature suggests, that TAM is a flexible framework which is able to be redesigned and modified to suit a particular subject such as the topic under investigation in this thesis. Six variables were selected for both academics and students based upon the depth of responses that were recorded. Six variables were deemed to be appropriate for both parties in order for the framework to be feasible as a working model. Although other interesting areas were mentioned and considered, the six areas for students were all articulated in depth and linked to established academic discussions. In order to maintain consistency, six areas for academics were selected with the same rationale.

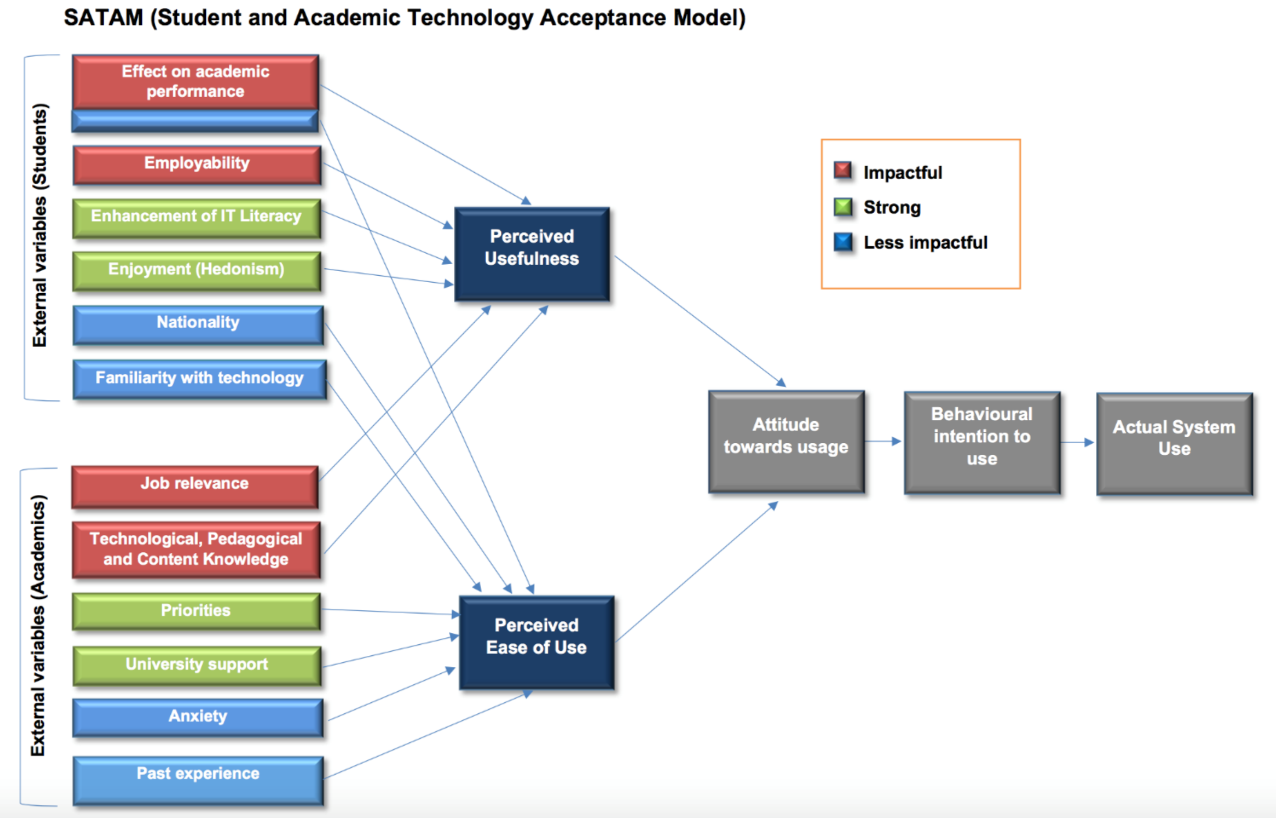
7.7 How SATAM was created

As mentioned, the external variables that form SATAM are all connected to the discussions and theories critiqued in the literature review after adopting a CGT approach and allowing theoretical saturation to occur. With regards to students, 23 themes were discovered at the end of the interview process from 2016-2017 (see Table 6 for information) and eight themes from the student focus groups from 2016-2017 (see Table 7 for details). After theoretical saturation and amalgamation of the data from NVivo from both the student interviews and focus groups, it was discovered that the areas of effect on academic performance, relevance to future career, enhancement of IT literacy, enjoyment [hedonism], nationality and familiarity with technology were most prominently elucidated. The same process took place for the academic section on SATAM using the data from the interviews. Twelve themes were discovered after two years and by theoretical saturation (see Table 18). These were ultimately converted to six final external variables: job relevance, technology, content and pedagogical knowledge, priorities, university support, anxiety and past experience (positive/negative). As mentioned above, each of the six elements for students and academics were aligned to academic literature and theoretical concepts in the literature review after conducting the constant comparison technique through the CGT process. Six variables for students and academics were decided to be a suitable number, as further constructs would have arguably diluted the framework and made the application onerous and overly complicated. Six was also viewed to be an appropriate amount, after comparing the number of constructs in other related technology models (particularly TAM 2 which has five variables and TAM 3, which has eight). These models are what SATAM most closely resembles.

7.8 The Student and Academic Technology Acceptance Model

Ultimately, the “Student and Academic Technology Acceptance Model” (SATAM) has been created as a result of this thesis with various external variables discovered as a key factor in influencing the adoption of learning technologies as can be seen in Figure 28 underneath:

Figure 28: The Student and Academic Technology Acceptance Model



Source: Based on Davis et al. (1989)

Figure 29 on page 259 will now explain and justify how each variable was constructed and why it was associated to PU and/or PEOU.

This figure demonstrates how each SATAM variable originated along with a rationale why each was selected for PU or PEOU:

Figure 29: How each variable was constructed and adapted

SATAM variable (Students)	Originating theoretical construct(s)	PU/ PEOU	Rationale for PU/PEOU
Perceived effect on academic performance	UTAUT 1 (Performance expectancy) UTAUT 2 (Performance expectancy) TAM 3 (Result demonstrability)	**PU/PEOU***	This variable can be divided into three areas – enhanced student experience and convenience (both leading to better academic performance) as well as the positive perceived impact on grades. It is argued that overall this variable is more connected to PU than PEOU although the second associated sub-variable (*convenience of use) is more closely associated to PEOU. Therefore, this variable is divided into three segments (see Figure 28 above) with two-thirds allocated to PU and one-third allocated to PEOU. Overall, this variable is seen as more connected to PU. Students commonly stated the need for learning technologies to be useful in enhancing their academic performance.
Relevance to future career	TAM 2 (Job relevance) TAM 3 (Job relevance)	**PU**	This variable was popularly aligned to PU with deep and rich responses evident on the need to link the learning technology provision to enhance employability skills.
Enhancement of IT literacy	TAM 3 (Computer self-efficacy)	**PU**	Enhancement of IT literacy was viewed as another useful aspect of being exposed to learning technologies. As mentioned previously, this variable is also linked to relevance to future career as discussed above.
Enjoyment [hedonism]	HMSAM (Joy)	**PU**	Enjoyment [hedonism] can also be connected to PU. This is due to a number of students in the data collection process

	UTAUT 2 (Hedonic motivation)		articulating the importance of lessons being fun and interactive. This strategy made the lesson more useful for learning and more compelling to attend.
Nationality	Hofstede (Power distance, Individualism/Collectivism, Masculinity/Femininity, Uncertainty Avoidance).	**PEOU**	Nationality is aligned to PEOU due to the respective abilities of the students interviewed and their perceptions of others. Certain nationalities (particularly Chinese and Nigerian students, who were most frequently discussed) were perceived to have difficulties adapting to new technologies. These issues were associated with components of Hofstede's cultural dimensions.
Familiarity with technology	TAM 2 (Experience)	**PEOU**	Familiarity with technology was clearly linked to individual past experience. Students with previous experience tended to be more likely to accept new technology whereas inexperienced students were not.
SATAM variable (Academics)	**Originating theoretical construct(s)**	**PU/ PEOU**	**Rationale for PU/PEOU**
Job relevance	TAM 2 (Job relevance)	**PU**	Job relevance is clearly aligned to PU with the vast majority of academics interviewed articulating that they were more likely to use a particular technology if it had positive perceived benefits for their role (and made their job less stressful).
Technology Pedagogical Content Knowledge	TPACK (Each construct)	**PU**	Similarly, TPACK is connected to PU as academics were increasingly likely to accept a technology if it had positive pedagogical benefits and met student expectations.
Priorities	TAM 2 (Voluntariness)	**PEOU**	Priorities in this respect is connected to PEOU. This is because academics were concerned if the technology was perceived to be overly complex, they would not have enough time to use it at the expense of other

			priorities (such as marking and course development).
University support	UTAUT 1 (Facilitating conditions) UTAUT 2 (Facilitating conditions)	**PEOU**	University support is also aligned to PEOU. This is because academics were less likely to experiment with or use a particular learning technology if it had not been effectively presented or explained (such as in a training session by learning technologists).
Anxiety	TAM 3 (Computer anxiety)	**PEOU**	Anxiety is linked to PEOU as academics were less likely to use a technology if they were concerned it was too difficult to use or would not work.
Past experience	TAM 3 (Experience) UTAUT 1 (Experience)	**PEOU**	Past experience is also connected to PEOU as past experiences (good or bad) determined if academics were more or less likely to use technology in future classes.

The framework focuses on PU and PEOU as the major determinants in influencing technological adoption in students and academics. Following an extensive and exhaustive data collection and analysis process, the final framework integrates relevant external variables that influence technology acceptance, attitudes, behavioural intention to use and actual system use. The conceptual framework incorporates these aspects in order to create a robust theory that can be used to ascertain the reasons behind technology acceptance in students and academics.

Many models such as this which attempt to explain the use of technology in teaching and learning tend to be from a Constructivist or conversational standpoint (Laurillard 2002: 102-103; Salmon 2003: 48). This thesis has adopted such a strategy and has created a workable and flexible model that can be used to determine technology acceptance at both CUL and in wider UK HE. Therefore, I do not support the arguments of Bagozzi (2007) and Venkatesh (2007) who view extensions to TAM (in the form of external variables) as uncoordinated, unintegrated and parsimonious. SATAM has taken advantage of TAM's flexibility to create a framework that is able to mix both PU and PEOU and includes specific variables that influence technology acceptance in students and academics.

7.8.1 SATAM explained

The colour of the variable in relation to PU and PEOU determines the strength of the relationship and the level of theoretical saturation that took place in the form of a “heat map”. For instance, if the colour is red (as in ‘job relevance’ for academics and ‘effect on academic performance’ for students) the relationship has impact. Furthermore, if the colour is green (such as ‘priorities’ for academics and ‘enhancement of IT literacy’ for students) the relationship between the variable and either PU or PEOU is strong although not as impactful as in the red category. On the other hand, if the colour is blue (as in ‘anxiety’ for academics and ‘nationality’ for students) the relationship is less impactful. ‘Impact’ and ‘Strong’ were selected due to their associations with qualitative research. ‘Significant’ was considered although ultimately rejected due to its connotations with quantitative research methods. As mentioned, the decision to categorise a variable as either red, green or blue was dependent on the depth and quality and of the qualitative responses that were presented in Chapters Five and Six. Unlike the original TAM, SATAM can mix PU and PEOU in each variable as displayed in Figure 28 and discussed in the Perceived effect on academic performance section in Figure 29. This variable is divided into three segments with two-thirds allocated to PU and one-third allocated to PEOU. Overall, this construct is seen as more connected to PU and arguably demonstrates the flexibility of SATAM.

Figure 30 on page 264 now explains how SATAM was constructed as a result of theoretical saturation as well as displaying each level of saturation:

Figure 30: How SATAM was constructed by theoretical saturation

Student construct	Theory/Theories	Saturation level
Effect on academic performance	UTAUT 1/UTAUT 2/TAM 3	Impactful
Relevance to future career (Employability)	TAM 2/TAM 3	Impactful
Enhancement of IT Literacy	TAM 3	Strong
Enjoyment [hedonism]	HMSAM/UTAUT 2	Strong
Nationality	Hofstede	Less impactful
Familiarity with technology	TAM 2	Less impactful
Academic construct	**Theory/Theories**	**Saturation level**
Job relevance	TAM 2	Impactful
Technology Pedagogical Content Knowledge	TPACK	Impactful
Priorities	TAM 2	Strong
University support	UTAUT 1/UTAUT 2	Strong
Anxiety	TAM 3	Less impactful
Past experience	TAM 3/UTAUT 1	Less impactful

As mentioned above, SATAM is arguably closer in structure to TAM 2 (and TAM 3) than the original TAM due to its inclusion of a specific number of external variables and their subsequent relationship to PU and PEOU. Although six unique external variables were discovered, there were different connections made between PU and PEOU demonstrating clear a dichotomy in technology acceptance between students and academics. For example, four variables were associated with PU in students (Effect on academic performance, Relevance to future career, Enhancement of IT literacy and Enjoyment [hedonism]). These results indicate that students are generally more focused on the usefulness of the technologies they use, rather than how easy they are to use although two variables (Nationality and Familiarity with technology) were associated with PEOU. On the other hand, academics were generally more influenced by PEOU with four variables connected (Past Experience, Anxiety, University support and Priorities). Two variables were connected to PU (Job relevance and Technological, Pedagogical and Content Knowledge). This suggests that academics are generally more focused on how straightforward a technology is to implement rather than how useful it is to themselves or their students. These findings are particularly interesting as they contradict to an extent the results from previous research. This is because teachers in the studies analysed in the literature review (which are mainly cross-sectional) tend to be viewed in the same way as students in that they are more likely to be influenced by the PU of a technology rather than by its PEOU. This thesis has established that academics at CUL are more influenced by PEOU with PU seen as a less influential construct in influencing attitudes, facilitating behavioural intention to use a particular technology and in ultimate technology acceptance.

It appears that the lack of clarity in the institution's overall pedagogical strategy has had a negative knock-on effect with the learning technologists and academics having no specific strategy or guidance to follow. This has resulted in academics tending to do as they please, leaving the rhetoric behind the institution's TEL curriculum to be mostly inaccurate. Students as the recipients of this approach tend to receive very different experiences, which are often dependent on the inclination and motivation of the individual academic to engage in CPD on their own initiative. This finding is in contrast to Laurillard's (2013) advice that universities need to adapt their pedagogical strategy from a more conventional teaching approach to one that is more inclusive of technology. Unfortunately, the results demonstrate that CUL does not have a transparent and clear pedagogical strategy at the moment. In fact, the university's overarching teaching strategy in practice was seemingly left to the interpretation of individual academics with learning technologists and their line managers unaware of a specific TEL strategy to be communicated on campus. It appears that little or no consideration had been paid to the seven elements of digital literacies that Coventry University's teaching, learning and assessment strategy seeks to accomplish. Considering the university received 'Gold' in the most recent TEF evaluation, this outcome is both surprising and rather disappointing.

7.9 SATAM limitations

Although this framework is proposed as useful and relevant in understanding the process of technology acceptance in both students and academics, there are nevertheless a number of limitations, which must be examined. First, it can be stated that the twelve constructs identified as external variables in this framework are very specific to the institution that was investigated. ‘Nationality’ is a case in point with the vast majority of responses focusing on Chinese and Nigerian students due to these being the two most dominant student populations on campus.

Indeed, the framework may not be entirely relevant to other dissimilar institutions with fewer international students (and perhaps with fewer international academics) than CUL. Nonetheless, SATAM can be applied by comparable post-1992 institutions as well as universities of a similar size and profile. It is arguably also relevant to universities that aspire to become “global places of learning”.

Moreover, it is acknowledged that the framework is influenced by the temporal context in which the data was collected. Indeed, the data can be regarded as a snapshot of the 2016-2018 period, which may or may not be able to be replicated in the future due to the constantly evolving and ephemeral nature of learning technologies and higher education. These technologies may prove to be out-of-date and eventually become redundant. However, it is suggested that the core structure from the HEA (Gordon 2014) which informed the empirical part of literature review (personalisation, flexible socialisation and flexible learning) and led to the creation of SATAM remains relevant and useful for UK HE. I also contend that the established and widely used theoretical frameworks, which comprised the external variables of SATAM, will continue to be applied in future technology acceptance research. Therefore, it is argued that any new learning technologies or theoretical concepts that were not part of this study can still be aligned to any future version of SATAM.

7.10 Chapter Seven summary

The dichotomy between the academic and student perspective regarding technology acceptance was discussed in detail in this chapter. PU was discovered to be a more influential indicator for students and PEOU had a stronger bearing in technology acceptance in academics. This is the first time such data has been uncovered in UK HE. These findings have ramifications for wider UK HE with the specific learning technologies examined in this thesis found to play a vital role in enhancing academic and student performance as articulated by Price and Kirkwood (2014) and Walker et al. (2017). Digital learning has been found to be a vital aspect of teaching at CUL, confirming the arguments of Beetham and Sharpe (2013) and Trowler (2010). It has been discovered that there are inconsistencies with pedagogical approaches and the PU and PEOU of the technologies that are available (Laurillard 2002; Laurillard 2013). It appears that the potential of technology is unfortunately still yet to be realised (Kirkwood and Price 2013; Christensen and Eyring 2011; Englund et al. 2016) and needs to be understood in greater depth (Sharpe et al. 2006). Chapter Seven has also provided a detailed overview of the conceptual framework that was created as a result of this research and has explained how it can be applied in other institutions. Limitations regarding SATAM were also observed.

The final chapter provides a conclusion to the thesis by answering each of the four research questions in detail. Chapter Eight also discusses contributions to knowledge and examines several limitations to the study and finishes by delivering specific recommendations for future research.

Chapter Eight – Conclusion

8.0 Introduction to Chapter Eight

Chapter Eight provides a conclusion to the thesis and answers each of the research questions in detail. Contributions to knowledge are discussed and limitations specific to this study are examined. The chapter ends by providing recommendations for future research.

First, each of the four research questions are answered, based upon the findings and discussion presented previously.

8.1 Research questions answered

1. **To what extent do external variables have an impact on technology acceptance in students?**

It was discovered that specific external variables have varying levels of impact on technology acceptance in students. Six external variables in particular were found to have an influence on PEOU and PU.

There were four variables associated with PU in students. The most influential variable was the positive perceived effect on academic performance. Students were more likely to accept technologies such as PowerPoint due to its perceived benefits in enhancing subject recall (Bartsch and Cobern 2003; Farley et al. 2015) and improving retention of the subject matter (Atkins-Sayre et al. 1998; Basturk 2008; James et al. 2006). Learning technologies such as ARS were generally viewed as useful in improving performance by increasing student attention spans (Mayer 1996; Wood et al. 2012). Students concurred with the findings of Price and Kirkwood (2014) and Walker et al. (2017) in that technologies were perceived to have a direct correlation to their academic performance.

The second most impactful variable was the link between employability and technology acceptance. Students were more likely to accept a particular technology if they envisaged transferring these skills to future employment confirming the findings of Kambiko and Mawer (2013) and Langan et al. (2016) who postulate that modern-day students see education as inherently linked to their future career. The inclusion of this variable suggests that learning technologies and their relevance in improving employability are important for students (JISC 2017b) and that digital capabilities have become increasingly essential in finding and retaining work (Beetham 2015).

The positive perceived benefits of enhancing IT literacy was another influential external variable, which led to better technology acceptance in students. Students were more likely to accept and use a technology if it had positive perceived advantages in improving their IT literacy. This was viewed as important to develop their confidence in using a suite of IT applications and help both their studies and life/employment after they graduated. These findings can be connected with Chowdhry et al.'s (2014) study who discovered that students who possessed the requisite level of IT literacy were more confident and accepting of its use. Students were more likely to accept and use a technology if they were able to develop their digital literacy (Sharpe and Beetham 2010; Gourlay and Oliver 2018).

Enjoyment [hedonism] was another variable facilitating technology acceptance, with students more likely to use a technology if it was useful in improving the classroom atmosphere (such as in studies by Blanco and Ginovart 2012; Conole and Alevizou 2010) and was able to satisfy individual intrinsic motivations (Lowry et al. 2013). As mentioned previously, these findings indicate that students are generally more focused on the usefulness of the technologies they use rather than on how easy they are to operate.

Two further variables (nationality and familiarity with technology) were associated with PEOU although these relationships were found to be weaker when compared to PU.

Nationality was discovered to be a less impactful variable and was mainly limited to Chinese and Nigerian students as these are the two most dominant nationalities on campus. There were contradictory statements on acceptance with some respondents stating that Chinese students struggled to use technology and were generally passive due to cultural issues correlating to the arguments of Straub

(1997); Hofstede (2001) and Issa (2014). On the other hand, different respondents asserted that Chinese students were generally proficient with IT. The latter finding was actually discovered during the lesson observations. Conversely, Nigerian students were mostly found to struggle with IT, perhaps due to not having a great deal of IT exposure before coming to the UK and feeling unconfident in ambiguous situations. Nigerian students tended to take longer to understand technologies in the lesson observations. Therefore, with the thesis focusing on only two nationalities (although discussing others), it is cautioned that this particular finding may be unable to create generalisability.

Familiarity with technology was the final variable which influenced technology acceptance although was less impactful than the others, arguably due to students being familiar with the majority of technologies at CUL as discussed in different studies by Prensky (2001a); Prensky (2001b); (Prensky 2010) and Tissington and Senior (2011). Students with a lack of familiarity (such as those from Vietnam and India) were soon able to learn new technologies relatively quickly correlating to Margaryan et al.'s (2011) definition of Digital Natives who are seen to possess more advanced cognitive capacities when compared to students of the past.

2. **In what way do external variables have an impact on technology acceptance in academics?**

Six different external variables were discovered to have an impact on technology acceptance in academics. In contrast to students, academics were generally more influenced by PEOU with four variables identified.

In terms of PEOU, 'Priorities' was discovered to be the most impactful variable. Academics were quite open that the lack of time they had contributed to their decision to accept or reject a technology (Mumtaz 2000; Hartshorne et al. 2005; Justice and Ritzhaupt 2015). Focusing on other responsibilities has resulted in many academics having an insufficient amount of time to experiment with and apply learning technologies in their lessons (Holley and Oliver 2009; Laurillard 2013). Similarly, the lack of targeted university support was discovered to be another variable which affected technology acceptance in academics. The thesis confirmed the arguments of Lai and Smith (2017) who suggest that, despite considerable investment, there is a perception amongst many academics that universities do not offer a clear and robust support strategy. It was observed that the actual benefits of learning technologies were not yet properly understood by the academics who were interviewed correlating to the arguments of Salmon (2003) and Kirkwood and Price (2005). It is clear that technology needs to be understood by academics in greater depth (Sharpe et al. 2006; UCISA 2018) with specific training programmes as part of a wider technology-infused pedagogical strategy needing to be delivered in order to improve the skills of academics and ultimately the learning experience for students (Porter et al. 2014; JISC 2017c).

Computer anxiety was another external variable associated with technology acceptance in academics, although this was less impactful than those discussed above. The thesis confirmed Davis' (2003) study on higher workloads increasing stress in academics. It was also discovered, at least to an extent, as Venkatesh and Bala (2008) posit, that computer anxiety on PEOU lessened after positive experiences of technology usage were accrued. Academics who were pro-active with technology tended to have less computer anxiety when compared to others who took less of an interest confirming the findings of Christensen (2002). Past experience was the final external variable that influenced technology acceptance and had the weakest relationship of all six external variables. Despite academics fitting the definition of Digital Immigrants as defined by Prensky (2001a; 2010), they tended to be generally positive when using technologies providing that they had experienced successes in the past (such as in the studies of Steffens 2008; LeSage 2009; Gauci et al. 2009; Patry 2009; Deng and Tavares 2013; Novo-Corti et al. 2013; Henderson et al. 2015 and Licorish et al. 2018). For instance, successful past experiences with ARS gave greater confidence that academics would produce similarly positive results in the future. On the other hand, academics were more reticent in using technology had they struggled to use it effectively in the past (such as in Bower and Wittmann's 2011 study) or if they had issues with IT infrastructure as discussed by Selwyn (2016). These four variables were all evidenced consistently throughout the two-year data collection and constant comparison process.

Two variables were connected to PU. Job relevance was found to be the most influential single variable that influenced technology acceptance in academics. Academics were much more likely to implement technologies if they thought that they were relevant to their job and were able to support student learning (McLoughlin and Lee 2010). Academics agreed that digital learning is a vital aspect of teaching at CUL confirming the arguments of Beetham and Sharpe (2013) and Trowler (2010). Job relevance contributed to the PU (Venkatesh and Davis 2000) of particular technologies such as the LMS (Alharbi and Drew 2013) and social media (Junco et al. 2012).

Technological, Pedagogical and Content Knowledge was another important variable that increased technology acceptance in academics. Although there was a lack of innovation (Cuban 2001; Mishra et al. 2010; Ertmer and Ottenbreit-Leftwich 2010; UCISA 2018) and confidence in applying technology, academics understood the pedagogical benefits for using learning technologies, even though they tended to use the same applications. Unfortunately, minimal experimentation and a lack of willingness to deliver innovative technological pedagogical practices was displayed throughout the entire data collection process. It was discovered that teachers needed to not only be familiar with the technical aspects of technology but also be able to understand its strengths and weaknesses in presenting engaging content and its relevance to specific pedagogical approaches (Harris et al. 2009). However, this situation was not easy to evidence, as some academics were confident and proficient using technology in their teaching, whereas others were not. The study confirmed the findings of Koehler and Mishra (2005) and Wetzel et al. (2014) who contend that although there has been a great deal of research on what academics need to know about learning technologies, there has been little attention paid on how they are able to learn about it. The lack of training and clarity from the university regarding its pedagogical strategy with learning technologies contributed to this issue.

Although these two variables are categorised in the “impactful” category on SATAM, the depth and of range of responses on variables associated with PEOU were overall richer and more pronounced than those linked to PU. This finding suggests that academics are more focused on how straightforward a technology is to use rather than how useful it is to themselves or their students.

3. To determine the reasons why specific learning technologies facilitate greater acceptance in students and academics.

It was discovered that there were different reasons why specific learning technologies facilitate greater acceptance in students and academics, although particular learning technologies associated with personalised learning and flexible socialisation perceived to be valuable (Gordon 2014), with personalised learning found to be the most useful. Two aspects of flexible learning were found to be less useful. For example, PowerPoint was seen by academics as an integral tool to be used in classes (James et al. 2006). Students also saw PowerPoint as comforting as it was familiar to them and they performed better (Lowry 1999; Gabriel 2008; Gauci et al. 2009). Furthermore, ARS was considered by academics as an engaging platform that can be used to create a better and a more interactive atmosphere for students (Kay and LeSage 2009). Students had similar views in that they enjoyed the competitive nature of quizzes and the resultant collaboration with classmates (Licorish et al. 2018). The hedonistic nature of ARS was also seen as influential in student technology acceptance (such as in Patry's 2009 study). For academics, VLEs were viewed as useful in improving communication and organisation (Henderson et al. 2015). The findings for simulations demonstrated the same opinions (Tao et al. 2009). Online discussion forums and resultant quizzes were noted as useful by academics in generating debate and as a valid and effective component of their TPACK strategy as discovered by Butcher et al. (2013) and Blanco and Ginovart (2012). However, there was a general reluctance by students to engage with forums as they were viewed to be less useful. Students wanted more input from their teachers (rather than from their classmates). In this respect, academics could perhaps set tasks on the discussion forum to engage students with the ultimate aim of improving their employability skills. For instance, students could create and upload a Youtube video of themselves in a workplace scenario and receive feedback from their teacher and peers.

YouTube was seen by academics as valuable in engaging visual learners and providing an interesting interlude between receiving lecture and seminar content. This view was also supported by students as in the studies of Williams and Williams (2011) and Conole and Alevizou (2010).

Social media, however, in the form of using Facebook and Twitter resulted in quite different opinions. Academics viewed these technologies as particularly destructive and more likely to distract rather than focus students, confirming the arguments of Madge et al. (2009). However, students reported social media as an effective interlude in breaking the monotony in classes and actually quite helpful in refocusing them on the content as found in previous studies from Kwong (2007); Roblyer et al. (2010); Junco et al. (2012) and Marley et al. (2015).

Mobile Learning also had conflicting views with both academics and students viewing it as useful (due to its portable nature) and the fact that it can be used as a prevention to distraction: such as when students are asked to use their devices to participate in an interactive quiz and are therefore unable to investigate irrelevant content, confirming the findings of Kuznekoff and Titsworth (2013). However, there was agreement on both sides that despite the advantages of using mobile phones in class, they can be addictive and there is an equal or greater likelihood that they are used for non-studying purposes. This latter issue was evident in the lesson observations, which demonstrated that students tended to resort to checking their phones as soon as they lost interest in a subject.

Instructionist pedagogical techniques were found to be less successful and less popular with the international students interviewed and observed in this study. Instead, these students were much more engaged when mainly Constructivist strategies were employed, confirming the arguments of Judson (2006). This finding indicates the need for academics to embed their teaching with appropriate and interactive learning technologies in order to meet student learning requirements (Gray and Smyth 2012; JISC, 2017c). As discussed, these technologies should focus on improving student performance, student employability, IT literacy, be enjoyable to use, be suitable for all nationalities and be practiced until they become familiar and cathartic. Likewise, for academics it is important that these technologies are perceived to be relevant to their jobs and to be grounded in effective pedagogy. To facilitate this requirement, academics need to effectively prioritise the use of learning technologies in their teaching toolkits. University support will play a key role in this strategy, and in turn, reduce academic anxiety and the possibility of negative experiences with technology taking place. Although this is arguably a rather utopian and idealistic scenario, it is nevertheless suggested that these changes need to take place in order for the digital competencies of both academics and students to be optimised so that they are able to cope in a digitally mediated, uncertain and disruptive future.

4. How do students and academics differ in their attitudes to the Perceived Usefulness and ease of use of learning technologies?

Although both students and academics are influenced by the PU and PEOU of technologies, there were differences noted regarding the degree of these influences. The study demonstrated that students were more accepting of technologies if they perceived them to be useful for their studying and future employability.

On the other hand, academics were more persuaded by the PEOU of technologies and were much more likely to accept and use them as part of their pedagogical strategy if they were seen as easy to understand and use. By applying SATAM, six different external variables were discovered, demonstrating that there were different connections made between PU and PEOU, illustrating a clear dichotomy between students and academics. For example, four variables were associated for PU in students (Effect on academic performance, Relevance to future career, Enhancement of IT literacy and Enjoyment). These results indicate that students are generally more focused on the usefulness of the technologies they use rather than how easy they are to use.

Academics were more influenced by PEOU with four variables connected (Priorities, University support, Anxiety and Past Experience). Two variables were connected to PU (Job relevance and Technological, Pedagogical and Content Knowledge). This discovery suggests that academics are more focused on how straightforward a technology is to use. These findings are particularly interesting as they contradict to an extent the results of previous studies. This is because academics in the studies analysed in the literature review tend to be viewed in the same way as students in that they are more likely to be influenced by the PU of a technology rather than by its PEOU. This research has uncovered that academics are generally more influenced by PEOU with PU seen as a less influential construct in influencing attitudes, facilitating behavioural intention to use a particular technology and in ultimate technology acceptance.

However, it appears that the lack of clarity in the institution's overall pedagogical strategy has had a negative effect with the learning technologists and academics having no specific strategy or guidance to follow. This may have contributed to academics being more influenced by PEOU than PU. If academics had been exposed to a more lucid pedagogical strategy, it is quite possible that the PU of learning technologies may have been more influential.

Ultimately, the lack of a coherent strategy has resulted in academics tending to do as they please, leaving the rhetoric behind the institution's TEL strategy to be inaccurate. Students as the recipients of this approach tend to receive very different experiences, which are often dependent on the inclination and motivation of the individual academic to engage in CPD on their own initiative. Unfortunately, the results demonstrate that CUL does not currently have a transparent and clear pedagogical strategy using learning technologies and the potential of technology is unfortunately yet to be realised (Kirkwood and Price 2013; Christensen and Eyring 2011; Englund et al. 2016) and needs to be understood in greater depth (Sharpe et al. 2006).

8.2 Contribution to knowledge

It is argued that this thesis has contributed to knowledge in three different ways. First, this is the first CGT study in a UK university using TAM that has discovered what specifically influences acceptance of learning technologies in academics and students. A CGT project of this scale and duration has not been conducted previously and the discoveries made have not been found to the same extent in any literature to date. CGT was selected as the most appropriate strategy to employ due to being able to co-construct rich data through my unique insider perspective. I propose that I would not have been able to have uncovered the rich, detailed and specific data on technology acceptance had another approach been used.

Secondly, the SATAM framework (demonstrating that there are six specific variables that influence technology acceptance in students and six others in academics) is a new and flexible way of understanding the differences in technology acceptance between students and academics. This framework is useful in explaining what particular variables affect technology acceptance for the institution. This is especially important so that the university is able to re-adjust its pedagogical strategy to maximise the substantial investment it has made in its IT infrastructure. It is also asserted that SATAM can be applied in wider HE in order to ascertain what affects technology acceptance in students and academics. SATAM can be used to identify the same or similar issues with technology acceptance and help to provide greater understanding of the subject in other institutions.

The variable ‘Employability’ is a particularly relevant variable to SATAM and has arguably not been explored to the same extent in any prior research in UK HE. There are very few articles on this topic and no study as recent as this research. This thesis has demonstrated that students are much more likely to accept a technology if it has a positive perceived effect on future employability. This finding highlights the need for the institution, and others, to create pedagogical strategies that focus on improving student employability through learning technologies.

SATAM is also contended to be a more complex, flexible and sophisticated version of TAM as it demonstrates clear relationships between specific external variables for students and academics via PU and PEOU. This contrasts to TAM’s linear approach to external variables. For example, ‘Perceived effect on academic performance’ in SATAM possesses parts of both PU and PEOU. This contrasts with TAM, which does not “mix” PU and PEOU. Although the variables are very much related to CUL, it is nonetheless argued that SATAM can be replicated in other institutions providing they follow the same CGT process with both students and academics. Although it is likely that many of the variables will remain the same, a new study may produce new constructs, particularly if the research is conducted at a Russell Group university, where the student and academic population may be different. Nonetheless, it is asserted that SATAM can be used most effectively at post-1992 institutions and also at similar London-based universities where the composition of respondents will be similar. It is also relevant to universities that aspire to become “global places of learning”. Therefore, this thesis is contended as beneficial in reviewing the current learning and development practices in students and academics and in offering constructive recommendations to improve the provision of learning technologies that is presently offered.

8.3 Limitations

There are a number of limitations regarding this research, which will now be examined. First, it was conducted at only one university. As a result, it was not possible to generate comparative analysis by analysing several institutions. The purpose of this strategy was to gather deep analysis of a subject close to my heart in an institution where I work and want to see progress. The intention was to improve the provision and quality of the learning technologies being delivered so both my fellow colleagues and students are able to make the most of one of the most significant investments made by the university and to share these findings to benefit wider HE. However, it is acknowledged that due to the relatively small numbers of interviews that have taken place, some of these findings may have resulted in unconscious bias and may have restricted generalisability, at least to an extent.

Moreover, with CUL being a subsidiary of the Coventry University Group, the student profile is different (there are more international students at CUL) meaning any recommendations may not be entirely relevant and might not be able to be replicated in other locations. Indeed, the results and recommendations (see below) may be more suitable to post-1992 universities rather than older, more established institutions. Nonetheless, these findings are argued as important for CUL and similar universities so that the provision of learning technologies is as effective as possible for both students and academics.

It is acknowledged that there may be a concern regarding the instruments used in the data collection process, in particular the tension between the aim to collect “rich” data and the number of the semi-structured interview and focus group questions that were applied. Although the number of questions (for instance, 25 for the student interviews and 11 for the student focus groups) could be construed as potentially excessive, the amount of rich and detailed data which was uncovered in the 578 pages of transcriptions is argued as useful and appropriate in providing detailed answers to each of the four research questions.

Furthermore, it would have been more useful to have observed each of the academics that were interviewed in order to view at first hand their use of technology in the classroom as well as to confirm if their responses were accurate. Unfortunately, this was not possible due to schedule clashes and certain lecturers moving to other universities. Nevertheless, it is asserted that the ten academics who were observed were able to provide a useful and representative perspective of how learning technologies are embedded into the CUL curriculum.

Finally, it is affirmed that these findings are very much a result of analysing the three-year period in which the study took place. The ephemeral nature of learning technologies may render these results potentially inaccurate in the future as educational technology is likely to continuously evolve. Nonetheless, it is contended that this study has created a framework that can be modified and utilised in future research. Although future learning technologies are likely to be more varied and undoubtedly more advanced and sophisticated, it is argued that they will continue to be based on the HEA areas of TEL, at least to some extent, and include the areas of ‘personalised learning’, ‘flexible socialisation’ and ‘flexible learning’ which this research adopted.

8.4 Recommendations for future research

This section has been constructed with recommendations for the institution and wider HE firmly in mind. These recommendations are aimed to inform the way academics teach and ultimately the way in which students learn with technology.

The first recommendation is that learning technologies should be used in a balanced way in symmetry with more traditional teaching techniques (such as group work, debates and role-plays). The research has demonstrated that technology is not a panacea to enhance student engagement although it is now an essential part of any academic’s pedagogical toolkit, and when used appropriately, is able to focus students on the subject being taught. The quality and relevance of a particular technology is much more appropriate than quantity. A personalised and contextualised approach will arguably lead to greater student engagement and enhanced job satisfaction in academics.

Secondly, the research has discovered that the institution needs to pay greater attention to the way employability is enhanced by learning technologies. It appears that there is a gap in the way that this is delivered at CUL, with students requiring a different learning experience where they are exposed to new skills in order to cope with a disruptive and uncertain digitally-mediated future. The students in this study were much more likely to accept and use a particular technology if it had positive perceived benefits for their employability. A case in point is the example of simulations, which had perceived benefits for both hedonistic purposes as well as having a positive impact on future employability. It is suggested that simulations continue to be a major part of CUL's learning technologies provision. In addition, it is important to develop students' lifelong learning and employability skills through technologies that are practiced both inside and outside of the classroom. Enhancing students' digital literacy will also allow them to build their confidence and capability with technology, which they will be able to transfer to future employment and eventually adapt to a changing and digitised society. Enhancing digital literacy will provide students with the technological tools to enable them to continue to learn throughout their lives. It is contended that a revamped university learning technologies strategy will be able to meet these objectives. It is also suggested that CUL needs to adopt best practice policies from competitors, particularly those that focus on embedding technology into the curriculum. It is important that the university effectively liaise with both employers and professional bodies (such as ACCA, CIM, ILM, CMI and CIPD[27]) so that they can adequately prepare students to be successful in their future careers. Both employers and professional bodies should have input into the curriculum. Further recommendations include the development of authentic learning experiences (such as 'live projects' where students carry out an activity that can be replicated in a future job). Examples may include the delivery of a training session, the creation of a recruitment and selection strategy etc. Moreover, the university needs to support students to better engage with employers. OIL and simulations may be one way of accomplishing this aim from a campus perspective. All of the above suggestions should form part of a unified teaching, learning and assessment strategy that has learning technologies at the heart of its design.

In addition, it is recommended that there should be a series of CPD training programmes that are available to all academics, with the focus being on how current HE students learn. This strategy will improve the knowledge, skills and attitudes of academics as well as reducing the possibility of technology anxiety occurring. These training sessions must be mandatory and not optional in order to increase

[27] See glossary for definitions.

attendance and the ability of everyone on the teaching team. These recommendations are similar to the policies integrated by The University of Plymouth (JISC 2013b) discussed in Chapter One, where the inclusion of digital literacies became part of the performance review process. It is also suggested that CUL could adopt a similar strategy to Bangor University (2018) and promote the use of innovative learning technologies to its academics through a Centre for the Enhancement of Learning and Teaching. Currently, there is no such provision in place.

The role and importance of the learning technology team should be valued by both the institution as well as by academics. They remain a vital component of the learning technology offering and must be seen as key stakeholders. However, it is also suggested that academics and students should be able to contribute to the process with an over-reliance on the learning technology team to be avoided. Academics should contribute to the development and inclusion of learning technologies into the curriculum. One way of doing so may be in the form of a 'suggestion box' which could either be physical or digital (such as on SharePoint). Everyone should play their part in this process. It is also recommended that academics should be recognised and rewarded for their role in ensuring teaching quality is enhanced through the integration of learning technologies. For students, it is suggested that VLEs and other learning resources remain as flexible as possible. Students should be able to solicit guidance from both learning technologists and their lecturers whenever is deemed necessary.

In terms of the infrastructure, the university needs to ensure that its technological capability (particularly the appropriateness of its resources and quality of the internet connection) are suitably robust. This will promote greater confidence in technology and increase the possibility of acceptance taking place. Furthermore, the content of future workshops that focus on learning technologies must be constantly monitored by the Head of Teaching and Learning so they are contemporary, relevant and adequately reflect the continuously evolving nature of technology. It is also recommended that these sessions are connected with each of the variables of the SATAM framework so that the needs of both students and academics are effectively addressed. This strategy will arguably increase the likelihood of technology acceptance taking place (with 'university support' playing a vital role in the overarching strategy).

Quality assurance should also play an integral role in this process to ensure quality standards are being met. For instance, it is important that the quality procedures in CUL are capable of analysing relevant student satisfaction data and responding to the needs of students, accrediting bodies and employers. Quality assurance should be at the forefront of these recommendations. Universities such as CUL should be able to effectively evaluate the current provision in order to maximise their investment. It is recommended that learning analytics should be introduced in order to measure, collect, and analyse how effectively the institution is supporting students and academics with digital learning. SATAM can be used to support this process.

Institutions such as CUL need to continue to look for ways to embed innovative and relevant technology into the curriculum. As discussed in the introduction, it is important to look for new, exciting and disruptive ways of educating, rather than relying on sustaining existing pedagogical practices. In order to accomplish this aim, academics should be given access to the latest software and hardware that can be used to effectively engage students and prepare them for the future. Technology should be utilised to develop student IT literacy and employability, with innovation a key aspect of curriculum design. This will ensure that CUL adheres to its TLA promise, which has TEL at the heart of the curriculum. This strategy should be consistent and part of the student experience, from the start to end of the course. It is also suggested that research into TEL should become a key part of CUL and other UK universities' research strategies in order to better infuse appropriate techniques throughout the curriculum.

It is hoped that this study and subsequent recommendations will improve the quality of the learning technology provision in CUL and in wider HE. As discussed at the start of this thesis - understanding how to maximise the effect of learning technologies in UK HE has never been more important.

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Appendix 1 – Ethical approval (Pilot process)

Appendix 1 – Ethical approval (Pilot process)

Certificate of Ethical Approval

Applicant:

Aaron Taylor

Project Title:

"The efficacy of learning technologies on student motivation and engagement – a case study of Coventry University London Campus"

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

10 December 2015

Project Reference Number:

P37248

Appendix 2 – Ethical approval (Interviews and lesson observations)

Appendix 2 – Ethical approval (Interviews and lesson observations)

Certificate of Ethical Approval

Applicant:

Aaron Taylor

Project Title:

'The efficacy of learning technologies on student motivation and engagement – a case study of Coventry University London Campus'

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

27 October 2016

Project Reference Number:

P45925

Appendix 3 – Ethical approval (Focus groups with students)

Appendix 3 – Ethical approval (Focus groups with students)

Certificate of Ethical Approval

Applicant:

Aaron Taylor

Project Title:

'The efficacy of learning technologies on student motivation and engagement – a case study of Coventry University London Campus'

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

20 February 2017

Project Reference Number:

P50877

Appendix 4 – Ethical approval (Focus group with learning technologists)

Appendix 4 – Ethical approval (Focus group with learning technologists)

Certificate of Ethical Approval

Applicant:

Aaron Taylor

Project Title:

'Applying the Technology Acceptance Model to ascertain the effectiveness of learning technologies in students and lecturers – a longitudinal case study at Coventry University London'

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

27 November 2017

Project Reference Number:

P61733

Appendix 5 – Ethical approval (Senior Managers)

Appendix 5 – Ethical approval (Senior Managers)

Certificate of Ethical Approval

Applicant:

Aaron Taylor

Project Title:

Applying the Technology Acceptance Model to ascertain the effectiveness of learning technologies in students and academics – a case study at Coventry University London

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

12 March 2018

Project Reference Number:

P67652

Appendix 6 – Interview questions with students

Appendix 6 – Interview questions with students

Interview script with students

Scene-setting

1. Why did you choose to join Coventry University London Campus (CULC)?
2. What subject do you study?
3. Why did you choose this subject?
4. Did you realise technology-enhanced learning was a major part of CULC's teaching and learning strategy before joining?
5. How is your experience of CULC different from your previous university?
6. Which classes do you like the most? Why?
7 Which classes do you least like? Why?

Teaching style

8. How often have you experienced learning technologies in lectures? Has this been a positive experience? Why/why not?
9. How often have you experienced technology-related activities in seminars? Has this been a positive experience? Why/why not?
10. Does the use of technology in class maintain your interest in a subject? Please explain your answer.
11. Do you feel more satisfied about a module if it uses learning technologies? Please explain your answer.

12. The use of online quizzes, creating YouTube videos, using presentation software etc. are commonly viewed as useful activities in engaging students in seminars and making classes more interactive. To what extent do you find activities such as these useful?

13. What do you think about Moodle?

14. What are your opinions of Turnitin?

15. What do you think are the characteristics of an ‘effective’ teacher that uses technology to engage students?

16. Can certain teachers use learning technologies too much? Please explain your answer.

17. Do you think the use of learning technologies inside and outside the classroom improves your experience? Why/why not?

18. Does the use of learning technologies improve your grades? Why/why not?

19. Does the use of learning technologies and your use of them improve your IT literacy? Why/why not?

20. Do you think learning technologies have an impact on your future employability? Why/why not?

Nationality and learning technologies

21. Do you think different nationalities find it more difficult to use learning technologies when compared to others?

22. What do you expect from teachers in terms of using technology?

23. Have your expectations of technology usage at CULC been realised? Why/why not?

24. In your opinion what is the most effective learning technology with regards to engaging and motivating? Please explain your answer.

25. Is there anything else you would like to add?

Appendix 7 – Focus group questions with students

Appendix 7 – Focus group questions with students

1. What particular learning technology has been most useful for your classroom engagement? Please explain your answer.
2. Has this particular learning technology improved your experience and satisfaction? Please explain why/why not.
3. What learning technology has not been so engaging? Why not?
4. Do you think certain nationalities engage more with learning technologies? If so, which nationalities and why do you think this is the case?
5. How do you think students and teachers differ in their attitudes to the effectiveness and adoption of learning technologies?
6. Do you think certain teachers are more confident and proficient than others? Please explain your answer.
7. Has your experience with learning technologies been consistent throughout your course? Please explain your answer.
8. How can teachers use learning technologies most effectively?
9. Have your expectations of technology usage at CULC been realised? Why/why not?
10. Do you think you will use any of the learning technologies you have been introduced to in the future?
11. Is there anything else you would like to add?

Appendix 8 – Interview questions with academics

Appendix 8 – Interview questions with academics

1. Why did you choose to work at Coventry University London Campus (CULC)?
2. How long have you worked at CULC?
3. Did you realise technology-enhanced learning was a major part of CULC's learning and assessment strategy before starting?
4. Have you worked in any other learning institutions? How were learning technologies implemented there? Was your previous experience different to CULC?
5. Do you think the growing emphasis in UK HE on embedding the student experience with learning technologies is a positive development? Why/why not?
6. How many hours per week do you spend researching about learning technologies when developing and reviewing courses?
7. What are the benefits are learning technologies? What are their limitations/issues?

In the organisation

8. What kind of technology-based training have you received? Has it helped you improve the effectiveness of your delivery?
9. Have you received any feedback on your use of technology in teaching? What kind of feedback was this? Was it beneficial to your development?
10. How much time in the past year have you actually spent in enhancing your knowledge of learning technologies?

11. What do you think CULC expects of you with regards to using learning technologies? How well do you think you are supported?

12. What do you think are the characteristics of ‘effective’ learning technology usage to engage students? Do you think you are an ‘effective’ teacher? Why or why not?

13. What would make you decide whether or not to use technologies in your class? (For example: pedagogical value, positive student satisfaction, other teachers use it, knowledge, fun, think students will expect it, your time, ability and motivation etc.)

14. How often do you implement learning technologies in lectures?

15. How often do you embed technology-related activities in seminars?

16. How do you use technology to maintain student interest? How do you use it to support weak students and stretch high achieving students?

17. Do you think the use of learning technologies impacts on positive student satisfaction? Why/why not?

18. How would you describe your teaching style, specifically referring to how you use technology?

18. How would you describe your teaching style, specifically referring to how you use technology?

19. How do you find out about technology-enhanced learning activities that are available? By peers/reading/other?

20. Compared to other colleagues, how proficient do you think you are with learning technologies?

Culture and learning technologies

21. Do you find any different nationalities are more difficult to teach than others? Why? Do any nationalities have difficulties using technology?
22. How have you used learning technologies inside and outside the classroom to engage students from different countries?
23. What do you think your students expect from you in the classroom in terms of technology-enabled learning? Do you think you always fulfil their expectations? If not, what are your reasons?
24. In your opinion what is the most effective learning technology with regards to engaging and motivating students? Please explain your answer.
25. Is there anything else you would like to add?

Appendix 9 – Focus group questions with learning technologists

Appendix 9 – Focus group questions with learning technologists

1. How do you help academics improve their skills with learning technologies?
2. To what extent do you think your support strategy is effective or ineffective? Would you improve anything?
3. What do you think are the benefits in using technology for international postgraduate students and academics?
4. Do you think there are any issues associated with the use of technology?
5. Please describe your experience with academics. Has there been universal acceptance or any resistance to accepting new technologies?
6. Please describe your experience with international postgraduate students. Has there been universal acceptance or any resistance in the acceptance of new technologies?
7. Do you think the use of technology is relevant to an academic's job? If so, do you think academics agree with this statement? Why/why not?
8. Do you think the use of technology is relevant to an international postgraduate student's experience? Why/why not?
9. What is your opinion of academics' technological pedagogical knowledge? Are certain academics more liable to use technology in their classes than others? If so, why do you think this is?
10. Does past experience (positive/negative) have an influence on the decision to use technology in academics and international postgraduate students?
11. Have you identified any international postgraduate students or academics with technological anxiety? If so, did this inhibit their use of technology?
12. What do you think form an academic's priorities? Do you think using technology is one of them? Why/why not?
13. Do you have any comments you would like to add?

Appendix 10 – Interview questions with Senior Managers

Appendix 10 – Interview questions with Senior Managers

Why did you choose to work at Coventry University?

2. How long have you worked at Coventry University?

3. Did you realise technology-enhanced learning was a major part of Coventry University's learning and assessment strategy before starting?

4. Have you worked in any other learning institutions? How were learning technologies implemented there? Was your previous experience different to Coventry University?

5. Do you think the growing emphasis in UK HE on embedding the student experience with learning technologies is a positive development? Why/why not?

Learning technologies

6. What do you think are the benefits in using technology for international postgraduate students and academics? What are their limitations/issues?

7. What policies do you have in place to help academics improve their skills with learning technologies?

8. To what extent do you think your support strategy is effective or ineffective?

9. How do you monitor and measure the success of your strategy? What would you like to improve?

10. Please describe your experience with academics. Has there been universal acceptance or any resistance to accepting new technologies?

11. Please describe your experience with international postgraduate students. Has there been universal acceptance or any resistance in the acceptance of new technologies?

12. Do you think the use of technology is relevant to an academic's job? If so, do you think academics agree with this statement? Why/why not?

13. Do you think the use of technology is relevant to an international postgraduate student's experience? Why/why not?

14. What is your opinion of academics' technological pedagogical knowledge? Are certain academics more liable to use technology in their classes than others? If so, why do you think this is?

15. Does past experience (positive/negative) have an influence on the decision to use technology in academics and international postgraduate students?

16. Have you identified any international postgraduate students or academics with technological anxiety? If so, did this inhibit their use of technology?

17. What do you think form an academic's priorities? Do you think using technology is one of them? Why/why not?

18. What specific recommendations do you have to improve the effectiveness of learning technologies for students?

19. What specific recommendations do you have to improve the effectiveness of learning technologies for academics?

20. Do you have any comments you would like to add?

Appendix 11 – Lesson observation form

Appendix 11 – Lesson observation form

COVENTRY UNIVERSITY

TEACHING OBSERVATION FORM

Part 1 – (to be completed before the observation)

Lecturers Name	**Faculty/School/Dept.**	**Course Title**	**Year**
	Human Resources and Organisational Behaviour	Professional and Academic Skills Development (102LON) Undergraduate	1
Observation Date	**Observers Name**	**Session Type** *(e.g. lecture, seminar, tutorial, practical demo, lab work, other, etc.)*	
10/11/2016	Aaron Taylor	Seminar	

Session Purpose and Aims *(a brief outline of the purpose of the session being observed and the student profile)*

This module is a skills module aimed at year 1 students as it covers the basics of academic work. It allows CULC to practice inclusive teaching: students from different demographic, social and cultural backgrounds can learn and adjust to the 'academic culture' at university (Broughan and Hunt, 2012).

This group consists of approximately 18 students of Accounting and Finance, and I have learned from my previous experience with this group that they like to hear about the purpose of our activities and why they are relevant for their studies and careers. The majority of activities in this seminar will be done in small teams which will allow students to a very specific and deliberate learning experiences (Griffiths 2012).

This week's topic is **team working**. In this seminar, we cover different aspects of team working, but most importantly students should learn:

Content-based:

What is teamwork?

Why is it important to work with others (e.g. performance)?

Reflective:

What aspects of team working are relevant for students' careers?

How do I contribute to their team's work?

In seminar 1 of this week students will have learned the basics of team working. In this seminar (seminar 2) students will work on specific tasks within their respective teams. The aim of this team-based activity is for students to put into practice their knowledge of teams and to critically reflect on their roles as team members. The challenge to design and present the findings of their reading exercise will help students to learn through teaching. This approach has proven to be very effective as students gain a deeper understanding of the relevant topic (Fiorella and Mayer, 2013).

References

Broughan, C. And Hunt, L. 2012. Inclusive teaching. In: Hunt, L. and Chalmers, D. eds. University *teaching in focus: A learning-centred approach*. Abingdon: Routledge, pp. 182-199

Griffiths, Sandra 2009. Teaching and learning in small groups. In: Frey, H., Ketteridge, S. and Marshall, S. eds. *A Handbook for teaching and learning in higher education – enhancing academic practice.* Abingdon: Routledge, pp. 72-84

Fiorella, L. and Mayer, R. 2013. The relative benefits of learning by teaching and teaching expectancy. Contemporary Educational Psychology 38(4), pp. 281-288

Session Learning Outcomes – *(indication of what the lecturer expects the learner to be able to do by the end of the session i.e. knowledge, skills, understanding, etc.)*

Understand the basic concepts of team working and learn that there are aspects of it that are particularly relevant for team performances.

Actively reflect on their roles within their respective teams.

Prepare for end-of-term assignment (as they will have time to write into their learning journals)

Designing a poster and presenting it to the rest of the class will allow students to learn by teaching others. Some students will also get the chance to practice their presentation skills.

Observation Focus – (*what aspects of your teaching would you like the observer to focus on and provide feedback?)*

Student engagement and participation – does the tutor create an atmosphere in which students want to learn?

Interaction between 1) students and tutor as well as 2) among students?

Classroom management (e.g. discipline)

Delivery (style)

Part 2 – (observer to complete and to discuss with lecturer)

Please circle as appropriate

Preparation, planning and organisation	**Excellent**	Good	Satisfactory	Poor	n/a
Session aims/objectives/outcomes					n/a
Teaching methods and approaches employed					n/a
Quality of the teaching/learning materials					n/a
Learner engagement, participation and interaction					n/a
Use of technology (where appropriate)					n/a
Delivery (style, pace, audibility, presence)					n/a
Management of the learning experience (classroom management)					n/a
Delivery adapted to student group					n/a

Checking that learning is taking place, where appropriate					n/a	

Please refer to the following page(s) for comments on the observation

Content

consider aspects such as appropriateness of level, is the content up-to-date, accurate use of examples, research-informed, lecturers subject knowledge, etc.

I was very impressed with the quality of your preparation and the way you integrated academic literature into your strategy. It is unusual to see this level of detail and consideration.

General feedback

You used a Padlet activity to share ideas. Perhaps this could have been a little larger as the font size was rather small? Before the team working activity perhaps you could have given the ground rules in a little more detail – for instance the groups at the back were using their phones during the activity (presumably to generate synonyms). This activity generally engaged students although there were several students at the back of the class checking their phones after the activity had finished. How can you continue to involve students who finish early? You gave students 20 minutes to read an article. Would it have been possible for students to do this before class as this reduces the level of interaction? One way to overcome this would be to employ a jigsaw reading activity: https://www.teachingenglish.org.uk/article/jigsaw-reading Students then read the article for 20 minutes. Another idea could be for students to interview each other to discover their Belbin team role – this link is quite useful and enhances classroom interaction: http://www.100pceffective.com/wp-content/uploads/Belbin-Team-Roles-Questionaire-V3.1.xlsx. You used the last 5 minutes for the students to create a poster on their interpretations of the article they read. Could you make the poster competition competitive to promote greater engagement?

Strengths You have a very professional and assured presence in the classroom. Your tone and use of body language is effective in engaging your audience. **Detailed and considered preparation. I was really impressed with this.** **You have a confident and assured delivery style. You come across as very professional and approachable which is fantastic.** **You communicate very clearly and elicit examples well. Your 'TTT' was low and you facilitated discussion appropriately.**
identification of strengths and best practice i.e. internationalisation, use of technology to enhance teaching, innovative practice, etc. **Your preparation for the class was exemplary.**
Areas for Development **'Policing' of the class – particularly those at the back who tend to avoid interaction.**

Ideas to involve others who finish an activity quickly (for example they could be used as 'monitors' or 'supervisors' for those who have yet to finish). **Ideas to avoid silence (such as 'jigsaw reading') and embedding pair-work activities.**
Additional Comments in relation to requested 'observation focus' (in Part 1)

Further Action (this should be jointly discussed and agreed by the observer and lecturer)
Lecturers Comments

Lecturers Signature:	Date: 30/11/2016
Observers Signature Aaron Taylor	Date: 30.11.2016

Appendix 12 – Risk assessment form

Appendix 12 – Risk assessment form

STUDENT RESEARCH PROJECT RISK ASSESSMENT

Person(s) undertaking project:	Aaron Taylor
Project supervisor:	Dr Christine Broughan

Brief outline of project: *Outline the types of activities that will take place or items fabricated i.e. face to face interviews, public surveys, water sampling, machining vehicle parts, brazing etc.*	Interviewing 5 academics at Coventry University London Campus on their experiences and perceptions of learning technologies with regard to enhancing student motivation and engagement.

Dates of study (from – to)	16th November – 17th December, 2015
Location(s) of activity: *Country and specific area.*	Coventry University London Campus

Will the project involve laboratory work? *If yes, you will be required to complete separate risk assessment(s) prior to carrying out any laboratory work.*	Yes / No
Will the project involve workshop work? *If yes, you will be required to complete an induction and may carry out a separate risk assessment(s) prior to carrying out any workshop work.*	Yes / No

Will the project involve travel? *(If yes, complete this section as fully as possible. The form may require review prior to travel to add missing details)*	Yes / No

Contact details at destination(s): Contact details of next of kin in case of emergency:		
Approximate dates of travel: *Your supervisor must have details of travel plans once confirmed.*		
Arrangements to maintain contact with the University:		
Emergency contact information:	School/Faculty contact (Daytime): 02476 .... 24hr University contact (Protection Service): 02476 888 555 Local healthcare/emergency services:	
Has suitable travel insurance has been obtained? (*Please attach a copy of certificate*)		Yes / No
If EU travel, has EH1C card been obtained?		Yes / No
Has advice/vaccinations from GP been sought (*where appropriate*)?		Yes / No
Are medical kits required (*i.e. in countries with poor healthcare facilities*)?		Yes / No
Are there any warnings issued by the FCO* against travel to the area?		Yes / No
Have you registered with the FCO* service LOCATE? *(British nationals only)*		Yes / No

*FCO = http://www.fco.gov.uk/en/travel-and-living-abroad/travel-advice-by-country/

PLEASE USE THE HAZARD CHECKLIST AS A GUIDE WHEN COMPLETING THIS SECTION.

Hazard	Precautions to be used
Work factors: *E.g.: dealing with the public, interviewing on sensitive issues, lone working, driving, working on boats, laboratory work; biological, chemical hazards etc*	N/A

Site specific factors (in the field): *E.g.: remote area, construction site, local endemic diseases, political unrest, terrorism risk etc* *If travel abroad see FCO* website – list any risks greater than there would be for the UK*	N/A

Environmental factors (in the field): *E.g.: extremes of temperature, altitude, weather conditions, tidal conditions, cliffs, bogs, caves, mountains etc*	N/A

Equipment: *E.g.: operation of machinery, use of specialist equipment, manual handling/transportation, compressed gases, etc*	N/A

Other: *Detail any special arrangements required, i.e. permissions required, accommodation, travel, catering etc*	

This assessment must be reviewed before any significant project changes are made.	
<u>Assessment carried out by:</u> Signature: Aaron Taylor Position: Lead Teaching Fellow Date: 19th October, 2015	<u>Authorisation to proceed:</u> Signature: Position: Date:

Appendix 13 – Participant information form

Appendix 13 – Participant information form

Participant information sheet

Study title: ‘The efficacy of learning technologies on student motivation and engagement – a case study of Coventry University London Campus’.

What is the purpose of the study?

This is a pilot study aiming to get feedback on the clarity/structure of questions that have been designed to investigate what particular learning technologies engage and motivate students.

Why have I been chosen?

You have been chosen to take part in this research as you are involved in teaching at Coventry University London Campus.

Do I have to take part?

No. You do not have to take part, participation is entirely voluntary and you are free to withdraw at any point. If for any reason you feel the need to withdraw from the study during or after participation, your data will be removed.

What will happen to me if I take part?

As part of the participation you will be audio recorded via Dictaphone. The data will be scored on an encrypted memory card and locked in a drawer in my office for which I only have the key. The data from the interviews will then be transcribed for analysis by NVivo software. The raw data will then be destroyed by 24th February, 2016.

You will be required to answer questions such as:

How do you use technology to maintain student interest?

How would you describe your teaching style, specifically referring to how you use technology?

Have you used learning technologies recommended by other teachers? What ideas have worked?

Compared to other colleagues, how proficient do you think you are with learning technologies?

What are the possible risks/ disadvantages to taking part?

There are no anticipated risks involved with participation.

What are the possible benefits of taking part?

The research will help to identify what teaching strategies are most successful. This will help to improve knowledge, performance and ultimately student satisfaction.

What if something goes wrong?

If you feel something is wrong you can withdraw without any repercussions and without giving a reason. If you wish to make a complaint you can contact Dr. Christine Broughan: christine.broughan@coventry.ac.uk.

Will my taking part be kept confidential?

Yes, the only individuals who will know of your participation are yourself and the researcher, all data is anonymously collected. The consent forms are kept separate from the data, which will be stored on an encrypted memory disk.

What will happen to the results of the research study?

This is a pilot study with the intention to receive feedback on the clarity/structure of the questions.

Who is funding/organising the research?

The research is funded by Coventry University London Campus as part of a PhD studentship. It is organised by myself, and is under the supervision of Dr Christine Broughan at Coventry University and Dr Debbie Holley at Bournemouth University.

Who has approved the study?

This study has been approved by the Coventry University Ethics Committee.

Contact for further information

If you have any further queries you may contact the researcher (Aaron Taylor) on this e-mail:

aaron.taylor@culc.coventry.ac.uk

or their supervisor,

Dr. Christine Broughan

christine.broughan@coventry.ac.uk

Appendix 14 – Informed consent form

Appendix 14 – Informed consent form

Informed Consent Form Template

'The efficacy of learning technologies on student motivation and engagement – a case study of Coventry University London Campus'. This is a pilot study to get feedback on the clarity and structure of the interview questions designed to answer this question.

	Please tick
1. I confirm that I have read and understood the participant information sheet for the above study and have had the opportunity to ask questions.	☐
2. I understand that my participation is voluntary and that I am free to withdraw at anytime without giving a reason.	☐
3. I understand that all the information I provide will be treated in confidence	☐
4. I understand that I also have the right to change my mind about participating in the study for a short period after the study has concluded (*by 24th February, 2016*).	☐
5. I agree to be recorded as part of the research project	☐
6. I agree to take part in the research project	☐

Name of participant: ....

Signature of participant: ....

Date: ....

Witnessed by (if appropriate): ....

Name of witness: ....

Signature of witness:...

Name of Researcher: Aaron Taylor

Signature of researcher: ....

Date:..

Appendix 15 – Gatekeeper letter