# Blended Learning:

# Undergraduate students' experiences of using technology to support their learning

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# Abstract

This thesis investigates undergraduate experiences of studying within a blended learning environment at a UK university in the first decade of the 21st century. Blended learning in this context comprises the use of institutionally provided technologies including a university-wide managed learning environment, alongside campus-based classroom teaching to support student learning. The personal ownership of technologies and their importance for the student learning experience is also considered.

The University of Hertfordshire has promoted itself as a 'blended learning institution' since 2005 and this study considers what blended learning means and how students use information technology to support their learning. The study approaches the student experience of blended learning by considering three constituent themes: the student, their HE study and their use of technology.

The preliminary study for this work used student constructed reflective video and audio diaries over a period of 18 months. Subsequently a new conceptual framework was drawn up by the researcher. This provided a matrix structure with which to explore through interviews with students their uses of technology for learning, and the relationship with approaches to pedagogy. The analysis of the interviews has provided a snapshot of students' experiences of pedagogy and technology use across their studies. A Venn diagram was used to explore the three themes and provide a representation of the extent to which technology is seen by students as a part of their everyday lives whether for study or leisure.

The student experiences reported here demonstrated a high degree of dependence on technology overall in both their personal and study lives. Their preferences were for a learning environment which included both the taught campus–based experience and the opportunity for easy online access to materials and supplementary activities to support their studies twenty four hours a day. As the students reported on their 'maturing' as learners during the course of the study, they described increasingly sophisticated online searching strategies and independent approaches to their learning regardless of their personal pedagogic preferences.

Garrison and Vaughan assert that the *'ideal educational transaction is a collaborative constructivist process that has inquiry at its core'* (2008:14). The outcome of this study presents a more complex view of the student experience of pedagogy in Higher Education. While recent research has reported on the student experience of either technology or pedagogy, the unique contribution of this study is its consideration of both pedagogy and the use of information technology from the viewpoint of the student experience.

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## Glossary

| | |
|---|---|
| 3G | 3rd Generation mobile phones |
| BLU | Blended Learning Unit |
| CETL | Centre for Excellence in Teaching and Learning |
| CMS | Course Management System |
| EPSS | Electronic Performance Support Systems |
| HE | Higher Education |
| HEFCE | Higher Education Funding Council for England |
| ICT | Information and Communciations Technology |
| IPA | Interpretive Phenomenological Analysis |
| IT | Information Technology |
| JISC | Joint Information Systems Council |
| LRC | Learning Resources Centre |
| LXP | Learner Experiences Programme (part of the JISC investment in its National e-Learning Programme) |
| MLE | Managed Learning Environment |
| VLE | Virtual Learning Environment |

# Chapter 1: Blended learning and researching the undergraduate student experience

*'…thoughtful blended learning is significant in implementation and transformational by intent.' (Nichols, 2010b)*

## 1.0 Introduction

In this chapter I introduce the broader context for my thesis on the use of technology in learning and the recent context for the term 'blended learning'. I consider the different definitions of blended learning which have been put forward in the past 10 years and give reasons for my own definition of blended learning and its importance. I then present my reasons for researching into blended learning, and the undergraduate student experience of using technology for supporting their learning and introduce the triple themes which permeate the narrative of this work; the student, their studies in Higher Education (HE) and the role of Information Technology (IT). Finally in this chapter I set out the plan of this work describing the choice of subject area, which includes my personal background reflecting on my own varying experiences as an undergraduate student in HE and a mature postgraduate student and as a teaching professional with and without the support of technology in learning and teaching. This is followed by an outline of the methodological choices, the research options and the various investigations into the student experience of using information technology to support their learning.

## 1.1 The context for considering the use of technology for learning in HE

The introduction of Information and Communications Technology (ICT) has been a fairly recent phenomenon and the effect of computers on modern society as they have transformed society and education since the middle of the 20th century cannot be underestimated. The famous, (but probably misquoted remark by the head of IBM and attributed to Thomas J. Watson): '*I think there is a world market for about five computers'* was made in 1943[1]. The academic and commercial view in the middle of the 20th century was that computers were a rare commodity used by specialists for specific tasks at a time when computers were seen as highly effective machines for analysing numerical data.

Now in 2010 the landscape for ICT is very different; access to the internet is asserted as a legal 'human right' in France and Finland, among other countries and a global poll identified over 80% of the respondents internationally as agreeing that access to the internet is a necessary part of their life. Every aspect of UK society has been affected through the use of computers and modern means of communicating as a recent survey into changing societies in July 2010 indicated (BBC, 2010). For our students this is epitomised in the expectation by their own UK National Union of Students (NUS) that all registered students in the union will have a mobile phone and email address and be contactable primarily through these means (NUS, 2010). Consequently it should not come as a surprise when a Vice Chancellor comments that:

[1] It is however more likely to have been made by Douglas Hartree in Cambridge, who suggested in 1951 that there would not be a requirement for more than three computers (Bowden, 1970)

*'Digital technologies are pervasive in contemporary society. Young people coming into universities have grown up with them and have high expectations that their institutions will provide reliable and easy access to online resources.' (Beer, 2009:2)*

Similarly the Funding Council for HE in England has stated that:

*'Our primary focus is on the enhancement of learning and teaching: this drives our approach. Technology supports this enhancement goal, and is therefore a factor in the development of effective learning, teaching and assessment strategies.' (HEFCE, 2009)*

As use of ICT has grown to become ubiquitous within our own society its impact on the student learning experience has also developed to be of considerable interest to pedagogical researchers as well as those who approach the subject from a technical aspect as educational technologists. Current research into how students experience learning with technology has attracted interest from influential groups outside academia including the UK government as identified in the recent House of Commons report, (House of Commons, 2009) following research conducted internationally in the last three years by, among other organisations, Educause (Oblinger and Oblinger, 2007) and ECAR (Caruso and Salway, 2007). These two organisations have highlighted the outcomes from research which indicate that the generation of 18 year olds now entering higher education in western society is both more technically knowledgeable and confident than any previous group of students and has very high expectations of what information technologies they might be able to use for their learning.

Alongside the growth in personal technology use that is evidenced by the use of mobile phones and email, the first decade of the 21st century has been characterised by a sharp growth in the amount and the availability of information technology for staff and students to use in HE. This growth in access to educational technologies has often been attributed to

the impact of the 'Dearing Report' in 1997 which called for the effective use of information technology in learning and teaching in Higher Education:

> *'The innovative application of… communication and information technology holds out much promise for improving the quality, flexibility and effectiveness of higher education. The potential benefits will extend to and affect the practice of, learning and teaching and research,' (Dearing, 1997: 13.1).*

The timing of the 1997 Dearing report coincided with the expansion of personally owned technology use across society. Mobile telephony was widely used in 1997 but it was not yet the essential piece of personal equipment for all strata of society that it is viewed as today, nor had the use of texting become the communication tool of choice for many under 25s that it has become by 2010[2]. The post-1997 adult generation of users has become a society where new iconic technologies such as the iPod have given rise to a 'nickname' which has been widely applied to a whole generation of younger users as the 'iPod generation' (see for example: Jefferies et al. 2007), regardless of their actual ownership of the technology. Other names for the generation born since 1980 have been proposed to reflect the fact that these adults and young people who first reached maturity around 2000 in the UK will not have experienced an education apart from one where IT has been prevalent or indeed overwhelming in its influence on their whole lifestyle. D. and J. Oblinger have referred to them as the 'Net generation' and 'Millenials' (Oblinger and Oblinger, 2006). Another recent study referred to the so-called 'Google generation' (Melville, 2008) from their use of probably the most commonly accessed internet search engine. National and international media have also picked up on Prensky's notion of comparing the younger generation of so-called 'digital natives' (Prensky, 2001) with the older generation of 'digital immigrants' who

[2] Various studies quote figures on SMS usage (Short Message Service) in Europe, with over 1 billion messages sent in the UK in September 2007, see for example Wordlingo (2010)

lack the apparent easy facility with digital technologies of those born post-1980. Prensky's views have been challenged in the literature recently (for example, Jones, 2009) and I will return in Chapter Seven to explore the dangers of trying to reduce the overall student experience to their interaction with IT and of resorting to stereotypical views of students, which considers them as both deriving from the 18-21 age group and of all being 'digitally competent and literate' (Beetham and Sharpe, 2010:155). Most recently the current generation of users born since 1995 has been referred to as the 'thumb tribe' because of their use of thumbs for sending text messages.

The adoption of digital technologies for learning by the incoming generation of students is not however seen as wholly positive. A recent survey into learners' experiences in HE (Ipsos/MORI, 2007) showed that, although technology is widely perceived to offer real benefits for learning and teaching, its potential impact is not yet fully exploited by HE institutions. The CIBER group's 'Google generation' report pointed to an apparently easy but somewhat superficial engagement with technology by young learners, which did not necessarily support an in-depth engagement with their learning: *'Internet research shows that the speed of young people's web searching means that little time is spent in evaluating information, either for relevance, accuracy or authority.'* (CIBER, 2008:12)

The importance of this comment for understanding student learning will also be returned to in Chapter Seven.

I cannot leave this introduction to the use of ICT by the current generation of students entering HE for the first time, without some consideration of those who enter HE as 'mature' students. A mature student in this context is defined nationally as someone who is

over the age of 21 on enrolment into a course of HE study[3]. Some of these students may be expert users of multiple technologies but others may be reluctant to use technology to support their learning and may even be deterred from entering HE because they know they are not, in Beetham's words 'digitally literate' (see above). They fear they will not be able to learn in an environment which has changed beyond all recognition from their own prior study experience at school (Vuolo, 2010). The experiences of some mature students at Hertfordshire will be considered further in Chapter Five.

In terms of the development of e-learning, the context immediately post-Dearing showed a substantial growth in the use of intranet technologies to support the potential for e-learning in HE. Prior to the year 2000, very few UK Higher Education institutions (HEIs) were in a position to offer more than the occasional distance learning or online course; the University of Hertfordshire was the first campus-based university (that is, non-distance learning institution) to offer a complete MSc programme in distance learning mode in the UK, as described below. Apart from the Open University and similar institutions worldwide such as Athabasca University in Canada which have specialised in distance learning for students registered and located remotely from their campuses, the necessary investment in the services, staff development, hardware and software provision required was not part of the strategy of most HEIs in the UK. Since 2000 however, many universities have been embracing the prospect of offering access to their materials online either in fully distance courses and programmes or through making access available to a Virtual Learning Environment (VLE) to their campus-based students. VLEs and MLEs (Managed Learning Environments) are akin to an intranet for educational institutions and now (in mid-2010)

[3] See for example http://www.york.ac.uk/services/careers/docs/uploads/Mature%20students%2009.pdf

provide widespread additional access to student learning materials outside the normal teaching contact hours for probably the majority of students in Higher Education in the UK. [4] The VLEs and MLEs may be chosen from among the commercial offerings such as Blackboard™ or an open source course management system (CMS) – such as Moodle, or else they may be developed in-house as at the University of Hertfordshire, with its MLE known as StudyNet. There is no doubt that learning and teaching in the sector now largely occurs in contexts rich in technology as noted by JISC:

> *'The UCISA Technology Enhanced Learning surveys have charted the progress made by UK universities between 2005 and 2008 towards technology-enhanced learning. …Technology is also now deeply embedded in the lives of the learners,' (JISC, 2009:6)*

In 2003 Garrison and Anderson commented on the growing impetus of technology in HE and advised that:

> *'It is imperative that those involved in higher education come to grips with the reality that technology is an increasingly important element of the educational environment and represents opportunities and constraints for interaction that can significantly influence students' perceptions,' (Garrison and Anderson, 2003:18).*

Furthermore, in 2004 Grainne Conole at the UK's Open University commented on the growth in general of e-learning and wrote that:

> *'E-learning is now no longer a peripheral activity, the province of the isolated enthusiast, but is pervading Higher Education, not just as an effective infrastructure for distance courses but blended with more traditional approaches on campus' (Conole et al, 2004).*

[4] JISC distinguished between MLEs and VLEs when it described a VLE as a system where learners and tutors participate in various types of on-line interactions and an MLE as 'the range of information systems and processes that contribute to an educational establishment's provision of learning and learning management, including a VLE if the provider has one' (JISC, 2000 p2). Roscoe (2002) echoed this view of MLEs, describing them as electronic learning environments that include other management information systems (MISs). One of the valuable consequences of linking a VLE to a university's MIS (as in an MLE) is the potential for each module's portal to be populated with the relevant student and staff details automatically.

It was from this point (2004 onwards) that the phrase 'blended learning' was first starting to appear in the literature of the e-learning discussions.

## 1.2 The development of blended learning from e-learning

Blended learning, online learning and e-learning are all terms which have been used to describe the use of synchronous and asynchronous methods of supporting learning through technological means. A form of 'technology enhanced learning' which has also been called 'blended learning', for much of the past decade, acknowledges the historical need to blend an academic environment with face-to-face delivery of material and which may access both new digital technologies and no ICT with a revision of existing and possible new pedagogies. The phrase 'blended learning' has been debated extensively by its many adherents (for example, Davis and Fill, 2007; Vaughan, 2008; Nichols, 2010b) and its occasional detractors (for example, Oliver and Trigwell, 2005) but has now settled into the e-learning language for two specific contexts. These are firstly, for commercial organisational learning programmes which provide a context for blending learning (see for example Collis and Moonen, 2007) and secondly, the area that is the focus of this thesis, the use of blended learning, which includes a blending of face-to-face teaching with the additional availability of materials online in a digital format. The local context here is the University of Hertfordshire, that is students in post-compulsory education; but nationally, forms of blended learning are now found throughout the HE and secondary school environments.

Why do I choose blended learning? Davis and Fill described Blended Learning (BL) as:

> *'…the combination of traditional face-to-face teaching methods with authentic online learning activities, [which] has the potential to transform student-learning experiences and outcomes,' (Davis and Fill, 2007:817).*

It is this opportunity for transformation which has excited many academics worldwide including myself and colleagues at the University of Hertfordshire. Garrison and Kanuka in some of the earliest writings to refer specifically to BL as a separate subset of the broader e-learning field asserted that:

> *'Blended learning is consistent with the values of traditional higher education institutions and has the proven potential to enhance both the effectiveness and efficiency of meaningful learning experiences' (Garrison and Kanuka, 2004).*

The latter description was further taken up by Peter Bullen, Director of the Blended Learning Unit at the University of Hertfordshire from 2005 when he described BL in the Hertfordshire context as: *'the harnessing of technology to support the face-to-face learning of students at a campus-based university,'* (Bullen, 2004).

Most recently Garrison and Vaughan summarised BL as: *'the thoughtful fusion of face-to-face and online learning experience'* (Garrison and Vaughan, 2008:9).

The latter is my preferred description because it both acknowledges the importance of personal contact between the student and the lecturer and the use of IT to enhance the learning experience and places an onus on the academic to present a considered and thoughtful blend. This is not then seen as a 'one-size fits all' solution which is primarily designed as a cost-saving investment by higher education institutions, a charge which has been laid at the door of e-learning by Entwhistle,[5] but the option of BL becomes a considered and thoughtful approach. The importance of the word 'thoughtful' in the Garrison and Vaughan summary is highly relevant here because according to Nichols, (2010b) it should lead to a focus on the learner rather than the design of the learning. Nichols also asserts that the value of blended learning lies in its significance to the student

[5] Speech at the National Conference for University Professors, The Royal Society, London, February 24th 2009

experience as noted by Dee-Finks (2003) and the opportunity for blended learning to be transformative (Mezirow, 2000). I will return later in Chapter Seven to the notion of how blended learning can be transformative.

## 1.3 Blended Learning at the University of Hertfordshire

Before an organisation can adopt a blended learning approach to its teaching and learning and seek the transformation of learning that technology adoption might allow, there is the necessity for a robust supportive technical infrastructure. In 1997 the University of Hertfordshire invested heavily in the necessary support systems and in staff expertise to develop a fully online programme for its MSc in Computer Science by distance learning. From these beginnings in online learning, Hertfordshire became one of the first universities in the UK to develop its own in-house managed learning environment or MLE, StudyNet. The university made a strategic decision to invest in its own provision of an MLE, which included the design and development, instead of buying into one of the commercial software systems mentioned above. StudyNet came online in September 2001 and following previous involvement in writing courses for the online distance learning programme I became a member of the team reviewing and supporting the development, designing the evaluation of use by students of the first prototype in summer 2001. I had a keen interest in the changing uses of ICT and the importance of a developing understanding of pedagogy for e-learning delivery for both academics and students at university. By the start of the 2002 academic year the MLE was providing personalised portals to access course and programme details for over 20,000 students and academic staff. An ongoing programme of training and support was introduced prior to the start of the pilot scheme, to ease the academic community into using StudyNet. This was further supported by the introduction of Faculty

and Departmental Champions (of which I was one), members of the academic staff who were willing to encourage the use of StudyNet and provide a local support network for other staff users, who occasionally perceived themselves anecdotally as the 'digital immigrants' (Prensky, ibid). The latter were often unfamiliar with the opportunities being presented via the new technologies for teaching and learning. The usage of the university's MLE provided a launching point for developing blended learning at the university and for examining the underlying pedagogies which accompanied the wider use across the university's multiple campuses of online and blended learning (as discussed in: Thornton et al, 2004; Bricheno et al. 2004, Jefferies et al., 2005a).

StudyNet provides access via the personalised student and staff portals to the websites for programmes of study and individual courses. These in addition provide access to databases of online journals as well as to a set of the more recently developed Web2.0 collaborative tools such as discussion fora, virtual groups, wikis and blogs. Logins to StudyNet have continued to grow numerically every year and totalled over 7.7 million in the academic year 2008-09, the latest year for which full figures were available.

The next stage in the development of an institutional blended learning viewpoint arose in 2004 when the University bid for and was awarded funding for a Centre for Excellence in Teaching and Learning (CETL). We were aware at the time of writing the bid of being a national leader in the use of synchronous and asynchronous e-learning and the choice of what to call the proposed Centre for Excellence was decided on as a Centre for Blended Learning[6]. The title was seen to epitomise the desire for combining innovative pedagogical and technological approaches at the time. In April 2005 the funding for the Blended Learning

[6] The use of 'Centre' was later replaced to become the Blended Learning Unit to allow for the more memorable acronym of BLU.

Unit CETL at the University of Hertfordshire was launched and a focussed programme of researching and evaluating the student experience of using technology to enhance the learning experience began, in which I played a leading role.

In proposing a blended learning approach to university teaching and learning, one of the basic principles mentioned above by Davis and taken up by the other authors was the potential of technology use to transform the student experience building up from the previous campus-based delivery and focus of the pedagogy. Drawing upon the opportunities afforded from easy and widespread use of the internet can lead to the thoughtful development of local resources supported by synchronous and asynchronous communication opportunities. My own practical experience of working day-by-day with students afforded me the opportunity to see a process of transformation growing over several years, but reporting its significance required a thoughtful and systematic approach. This takes us back to my choice of Nichols for the chapter quotation since the idea of researching the student experience of blended learning has guided my developing doctoral work.

## 1.4 Early research of the student experience of blended learning- a personal driver for the doctorate

As indicated above I have been researching the student use of e-learning and technology-enhanced learning for over nine years since early trials with a pilot group of students in the use of StudyNet in the summer of 2001, (Jefferies et al., 2004a; Thornton et al., 2005). In my dual role as an academic in the School of Computer Science and a researcher into blended learning I have straddled the divide between the technology I am teaching with and the engagement in learning I seek to encourage in my own students. My motivation has

developed from a keen interest in the way that students use technology to support their learning and my early research into the extent that this can enhance their overall university experience. At the same time my interest in the developing of pedagogies has led me to research into new approaches to teaching in the current digital age. From an early stage I was seeing results from the research with students which indicated that many of them stated a preference for a blended approach to their learning, that is the use of technology to support the face-to-face experience in the lecture hall and seminar room, compared with an approach which did not use IT (Jefferies et al, 2004a). This ease of electronic communications noted and valued by many of the students at Hertfordshire as a means of supporting their learning was also being reported by Sharpe and Benfield in their review for the Joint Information Systems Committee (JISC) of the undergraduate experience of blended learning:

> *'We find that student response is overwhelmingly positive to the provision of online course information to supplement traditional teaching. Students make regular and frequent use of electronic resources with few reported problems of access,' (Sharpe et al., 2006:3)*

This document was the first major systematic attempt to review the use of the growing interest in Blended Learning in the UK. It followed from Britain and Liber's early review of e-learning practice in HE across the UK in 1999 which had reported a patchy (at that time) institutional take-up of technology to enhance learning across HE (Britain and Liber, 1999). Sharpe and Benfield came to the University of Hertfordshire as part of their research for the report as the University's Blended Learning Unit was starting in mid- 2005. As an institution we had already been researching the student access to the intranet for their studies (see above). As members of the BLU team evaluating StudyNet use and student attitudes to on-

line accessibility to their learning, we could already report on high and increasing access numbers to StudyNet and our own research outcomes which had identified the students' preference then for an 'anytime, anywhere' approach to accessing their study materials, a popular phrase derived from the Martini advertisements, (Jefferies et al., 2005b). By 2004-05 I had already been using many facilities on StudyNet, including the virtual group facility on a module by module basis with my students and knew anecdotally that many students found that this supported their preferred way of working and that the facility of being able to access, download and update their group work in a single place for the online group assignments was of real benefit to them.

From a personal and professional point of view therefore I was motivated to research further how a range of students used online technologies for supporting their learning and to see whether, as Sharpe and Benfield had reported, there was a very positive impact of blending learning which was wider than my own group of technically competent students in Computer Science.

## 1.5 The Research Questions

This thesis explores the uses of information technologies of a group of campus-based students on their undergraduate programmes, within the context of the university's provision of a blended learning environment. The questions which the research explores are:

- How do students use technology to support their learning at the University of Hertfordshire?
- What is their experience of blended learning as students on a campus-based programme?

- What is the experience of pedagogy for these students at a 'blended learning' university?

The research is presented here in two stages. The preliminary study which I refer to as stage one and which is reported in Chapter Five researched into students' uses of technology to support their learning and started initially through my work for the BLU and a two year project into students' journeys in technology use, which I led and which was part-funded by the JISC, (Jefferies et al., 2009). This 'learners' journeys' project known as STROLL (from STudent Reflections On Lifelong e-Learning) of which I was Project Director provided the basis for my doctoral studies, occupying as it did a substantial part of my work load for 24 months from March 2007 to February 2009. It was one of seven nationwide projects funded by the JISC E-Learning Programme for research into Learners' Experiences Phase 2 (JISC, 2007) and so was an important and influential project in terms of providing a longitudinal view of the student experience of using technology to support their learning. The STROLL project findings have been widely disseminated nationally and internationally in published conference proceedings such as Networked Learning, JISC, ECEL, BLU and in journal papers (for example Jefferies et al, 2009; Jefferies and Hyde, 2010).The LXP2 findings, which included the output from the STROLL project, have led to further investment by JISC through their E-learning Programme into learning literacies, examples include the LLIDA project in 2009 (Beetham et al., 2009a and 2009b) and supporting student learners in a digital age (SLiDA,2010).

My own doctoral studies have used some of the substantial outcomes from my learners' journeys project for my study, namely a set of video and audio diary data. It was from the basis of building an understanding of how students use technology to support their learning

at university via the diaries that I was then able to proceed to stage two, which is the development of my pedagogy/technology framework.

The primary means for gathering data on students' experiences in the preliminary stage was via the use of student-constructed reflective video and audio diaries. In the second stage of the research I developed and tested the use of my pedagogy/technology meta-framework with a smaller group of students and used semi-structured interviews for data gathering. The research design approaches will be described in detail below in Chapter Four.

Video and audio diaries provided an initial and rich source of qualitative data which identified the technologies that students chose to use and the later research provided an insight into how students described themselves as 'maturing' in their learning while at university and their changing uses of technology. These lead into the discussion of the student preferences for different styles of pedagogy.[7]

## 1.6 Summary: three themes and the narrative of the thesis

In this introduction to my thesis I have located the rise in technology use generally over the past sixty years and in particular the last decade, and its impact on successive generations of users. I have described how the growth of the importance of accessible e-learning was first promoted nationally following the Dearing report which pointed forward to the widespread institutional uptake of e-learning in the UK from 2000 onwards. I have introduced my professional practice as a lecturer in Computer Science and my role from 2005 to 2010 when I was seconded to work as a member of the Blended Learning Unit. I have drawn on my

[7] While there are a number of definitions of pedagogy my preferred choice is from Loughran, (2006:2) who describes pedagogy in the following way: *'Pedagogy is...about the relationship between teaching and learning and how together they lead to growth in knowledge and understanding through meaningful practice.*

personal interest in researching the use of students' responses to, first of all, e-learning and then to blended learning with my students at the University of Hertfordshire and introduced my main research questions from a background of the drivers for my personal doctoral studies.

I referred in the introduction to the three strands of interest which have been laid out here; the use of ICT for learning, the HE student and their HE studies. I view the different aspects of this thesis within this triple lens and have chosen to portray them visually as a set of intersecting circles in a Venn diagram. This will be discussed in detail in Chapter Four. I return to the themes throughout the chapters of this thesis and particularly in Chapters Five, Six and Seven where I discuss the findings from my research.

In Chapter Two I trace my own narrative through personal experience as a student, as a teacher then as a mature student in Computer Science as my interest in technology and its uses grows and finally then consider my experience as an academic in the School of Computer Science. The narrative explores my own developing views of pedagogy from being 'a consumer' and then a 'deliverer' of learning and the influences on my changing attitudes to pedagogy. In Chapter Three I explore the changing nature of pedagogy for learning and the impact of technology for developing e-learning on approaches to pedagogy. This chapter forms the basis for discussion on the appropriateness of different e-pedagogical approaches and how this might affect university undergraduates. In Chapter Four I describe the research methodology adopted for the two stages of the research into how undergraduates describe their learning experiences and their use of technology to support their learning and the subsequent development of my meta- framework.

The literature study extends throughout the areas of blended learning, pedagogy, technology and research methods. As I demonstrate in my discussions on developing pedagogies for blended learning and e-learning, this is an area of research which is highly dynamic and where the literature has developed rapidly in the past four years. Therefore, I have taken the decision not to present the literature separately in a chapter since the literature permeates throughout the work, and as I comment in section 4.1.4, a study of the literature should really precede the decision making about the planned research (Robson 2003: chapter 2). With the particular topic of blended learning there is a *'carpe diem'* point at which the day must be seized and the literature applied as it stands at the time and for that material.

In Chapter Five I present findings from the preliminary stage of the research into the student experience of blended learning, the series of reflective diaries carried out over a period of eighteen months with a set of undergraduates from across the University's campus-based programmes of study. In Chapter Six I present the outcomes from the second stage of my research which was a set of semi-structured interviews with a sub-set of the diarists as they approached graduation and describe the practical application of using my own conceptual framework. In Chapter Seven I review the overall outcomes of the research and draw conclusions on these students' experiences of blended learning at Hertfordshire from my three themes and discuss future avenues for researching the student experience of using digital technology to enhance their learning.

I have demonstrated in this chapter that technology to support learning is now embedded within much of HE and has been part of my own university's strategy for nine years. Blended learning provides a useful descriptor of the balance between the technologies used to

support face-to face taught courses and a fully online approach to learning. However, it is not just the amount of technology used which is important to explore, but how students learn in a technology-rich environment.

# Chapter 2: Reflections on a changing view of learning and pedagogy

*'…only learners themselves can learn and only they can reflect on their own experiences.' (Boud, 1985)*

## 2.0 Introduction

One of the core aims of undertaking the studies for a professional doctorate in education is to examine the impacts of the research on practice and to reflect on what it means to be a researching practitioner in the field of education. I use this chapter to explore aspects of my own experience within my approach to both practice and research. I achieve this by showing how my personal learning experiences from both sides of the secondary and university classroom have been informing and contributing to my changing practice over many years, from being a school pupil and then a university student in the 1970s to my current role in HE as a university lecturer. This chapter is the starting point for my considerations about pedagogy and e-pedagogy which are presented in the following chapter and lead on to my discussion of ontology in Chapter Four, where I reflect on the reasons for my choice of research methods and methodology.

The general impact of information technology over the past decades and its growing influence within education which I traced in the previous chapter has happened in co-development with my own life experiences of being a schoolgirl and a student, a teacher and then later from 1990 a mature student and a lecturer in HE. At this point in my career (2010) following a major change of direction in 1990 there is an almost equal amount of time that I have spent using ICT both for learning and for supporting learners within HE, as I

had previously spent between the mid-1970s and 1980s focusing on modern foreigh languages as a student and school teacher.

There are multiple strands to this personal reflection but in seeking to understand how my own practice has been informed by my personal experience there are a number of key stages described. My starting point for this reflection is explained in Etherington's words below.

> *'I understand researcher reflexivity as the capacity of the researcher to acknowledge how their own experiences and contexts (which might be fluid and changing) informs the process and outcomes of inquiry.' (Etherington, 2004).*

I explore through these multiple experiences of being both the student and the teacher how my own practice and research have developed, culminating in my current role lecturing in Computer Science. I consider how my research into the use of technology in learning and my inquiry into the student experience has developed from these earlier experiences. Finally, I reflect on my choice of topic for my EdD research and how it relates to my current practice, in the process of which I provide some answers to the questions: Why am I interested in student views of their experiences? Why do I prefer to take a constructivist approach to my teaching?

I show how my changing understanding of learning and teaching, firstly of modern languages and then of computer science drew on my personal experiences of different pedagogic styles.

## 2.1 Where does the pedagogy come in?

Before I embark on my description of my experiences of being taught and being a teacher, I provide brief descriptions of the three pedagogical approaches to which I refer below. I shall discuss all of these in the next chapter in more detail, when I consider their appropriateness when using information technologies to enhance teaching and learning.

The three broad theories I personally encountered in a roughly chronological experience of learning are: the instructivist or associative approach, the constructivist approach and the social constructivist approach. Later in Chapter Three I explore more recent ideas relating to a community of practice and how this can be used with learners in HE. In this section I will set the context using explanations primarily from the work of Mayes and de Freitas (2008).

An instructivist approach is described as one where: *'learning is defined as building concepts or competences step by step…People learn by association through basic stimulus-response conditioning later by associating steps in a chain of activity to build a composite skill,'* (Mayes and de Freitas, 2008:218).

A constructivist approach is described as: *'achieving understanding through active discovery…People learn by actively exploring the world around them, receiving feedback on their actions and drawing conclusions.'* (Mayes and de Freitas, 2008:222). Social constructivism is described as: *'achieving understanding through dialogue and collaboration…Individual discovery is heavily scaffolded by the social environment…Social constructive theories are concerned with how emerging concepts are supported by others, enabling learners to reach beyond what they are individually capable of learning in the zone of proximal development.'* (Mayes and de Freitas, 2008: 223).

## 2.2 Student and teacher: the linguist and the computer scientist – the choices I made

In this section I start by reviewing my own experiences as a learner in primary and secondary education and my subsequent choice of subject as I went to university to pursue modern language studies and to become a linguist. I then reflect on my experiences of teaching languages in an urban comprehensive school and the experience of being a mature student

prior to teaching computer science in HE, showing how on a personal level my understanding of and engagement with learning theory developed through my professional practice.

I consider whether there are similarities between teaching languages and teaching computing and reflect on the changes in my own experience as student and teacher from a reliance on instructivist approaches to teaching and my subsequent change to developing a more constructivist approach in my teaching.

### 2.2.1 Early learning experiences

My own experiences of being taught at school and university in the 1960s and 1970s were generally that my teachers followed an instructivist approach. In my rural primary school several classes were often combined. Desks and chairs were in rows for all pupils including the Infants.There were just two classes for all the Junior pupils and a large school hall built in the 1880s where between 40-50 of the oldest children sat and were taught either collectively or in groups according to ability.

In my secondary school there was little time for collaborative work or discussion and even languages were taught through much use of linguistic repetition and with little encouragement for using the language to communicate through regular conversation. This was typical of what was even then a rather outdated approach, as I would discover when I studied for my PGCE in 1976. All languages, whether modern and 'living', or classical and 'dead' were considered from the point of view of being an academic exercise of learning a grammatical structure and a set of vocabulary from which correct language was assembled with the purpose of being able to communicate through a written medium and to read the printed word. The fact that this had little congruence with the language spoken by the native speakers appeared to be of minor importance. Like many of my fellow students, I learnt and

practiced the grammar with the building blocks provided but did not really learn at the time how to communicate through spoken language.

On reflection, I knew at the time that my personal choice to continue my study of languages was probably swayed by the example of an excellent French teacher, who instilled confidence in her pupils, and a love of the written word. I subsequently chose to spend three years on a traditional university honours programme at London University embedded in the study of French literature and language. I turned down the opportunity to spend a year as an *'assistante'* in a French school because at the time I preferred the structural nature of building a language and reading about ideas to the more risky idea of spending time abroad. My student experience at university was of a style of teaching where lectures were delivered didactically to large groups in a more, or less, entertaining way alongside a pattern of smaller tutorial groups. Some seminars gave the opportunity for limited discussion and interaction. While I had enjoyed reading and writing in an ordered and calm atmosphere from a very young age, I was quite content to be the recipient of the instructivist approach to teaching, which I experienced at university. The perceived challenge of students and tutors was to try to ensure that learning took place and an instructivist approach was the time-honoured way of delivering material. In my experience, university teaching at the time largely followed the school pattern and typically reflected how the academics and students had all been taught themselves and there was at the time little incentive to do anything differently and 'rock the pedagogical boat'.

### 2.2.2 Early experiences of secondary teaching

Since the mid 1970s there has been a slow and persistent change in many secondary schools and universities in their underlying approaches to teaching and learning, sometimes described

as an embracing of a Piagetian approach to learning (Piaget, 1970) where the importance of individual discovery displaced the previously dominant instructivist view . As a trainee teacher I was introduced to this as part of the challenge to involve children in their language learning activities when I undertook a PGCE. In the four years since I had left school the teaching of languages had apparently undergone a sea-change but it was more likely that the differences had been happening little by little previously and it was the established teachers who were unwilling to change a perceived 'successful formula' which suited their more academically inclined pupils. From the late 1970s and early 1980s my own teaching in a London overspill urban comprehensive developed via a combination of informal theories derived from experience of classroom management strategies and growing professional expertise to the point where I was engaging the pupils with a foreign language that they could speak and listen to, while their own English language writing and reading skills were well below the average for their age. What had led to this transformation? Pragmatically, it was the impossibility of using either written work or reading exercises to engage the attention of many of the children, plus I wanted to be creative in engaging them with activities which would motivate them in their learning (see for example Oxford and Shearin, 1994). Using group work and pictures, which removed the need for reading and writing, here was a subject where the less-academically able could now succeed without being hampered by their low-levels of written English.

Reflecting back I can now see that a metamorphosis had taken place and the product of an instructivist and highly teacher-focussed school and university environment had transformed into the secondary teacher whose pupils collaborated and constructed their language learning, chatting away confidently. I had not self-consciously adopted a different theory for my pedagogy, but within the culture of secondary comprehensive schooling at the time, it had become a case of adopting a set of successful strategies for teaching the curriculum. It was in

my view a matter of different skills being required for different learning outcomes, within a culture of inclusion which saw languages taught across the age and curriculum range. Although I had not articulated it thus at the time, I now consider it is not possible to become a confident spoken communicator in another language without adopting a constructivist approach to learning since it is essential to construct the knowledge of a language in collaboration with others. Being a linguist, as opposed to studying linguistics, is by necessity a socially constructed activity, where the spoken and written language capabilities should develop the more a language is read, listened to and then practiced with others.

### 2.2.3 Language learning and computer programming – a surprising combination?

In my early development of a conceptual framework for learning, which will be described in greater detail in Chapter Four, I considered a chronological approach to reflecting on how pedagogical theories are experienced by both the researcher and subjects of the research. I represent this below in Figure 2.1. The arrows on this personal example of my conceptual framework for associating pedagogy and technology indicate how my own patterns of learning and teaching changed after I had been developing my professional practice in a secondary school environment. In my early years as a teacher, there was no meaningful engagement with information technology to support learning and so all the learning takes place to the far left of the framework. As I started using computers both as a tool and for supporting my learning (albeit in a minor way in 1990) the shift of the learning focus moves to the centre of the framework but there was a strong shift to an instructivist approach to the teaching which I experienced during my Masters year, and so the pedagogical focus moves to the bottom of the diagram from the higher location shown when I was experimenting with constructivist approaches to my secondary teaching.

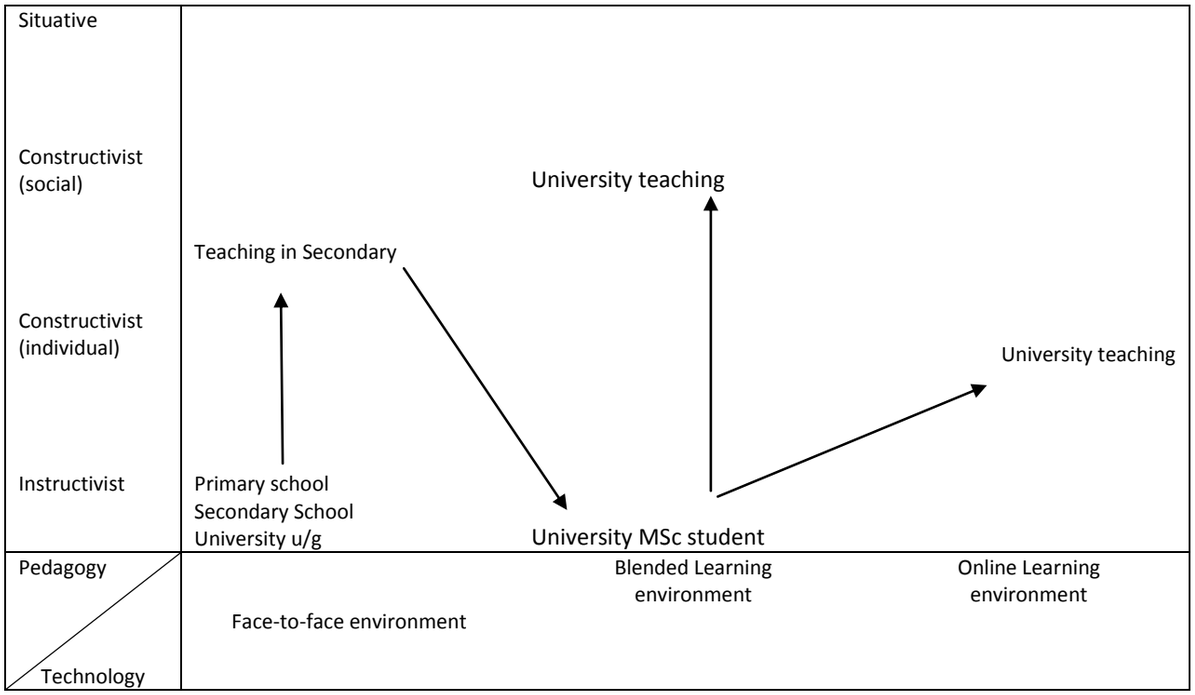



**Figure 2.1 Reviewing my personal journey in using pedagogy and technology for learning and teaching**.

Having demonstrated a move to a constructivist approach in language learning and teaching, how did this apply to my own studies as a mature student and subsequently as a lecturer in Computer Science? There are many similarities between learning to write software programmes to communicate with a computer and communicating in a foreign language. After all we talk commonly about a variety of 'computer languages' used for programming. What else is a computer programme but a set of instructions written in a syntactically correct way to ensure that the computer follows the desired set of commands and actions? It should not come as a surprise that there are many linguists employed as computer programmers, since while I concentrated above on the linguistic communication skills required to *speak* another language we should not neglect that these need to be taught and constructed in a

grammatical framework. Whereas the language teachers who approached language teaching as an academic exercise devoid of communication with native speakers may have offered generations of children a disservice, there is no escaping the fact that languages have rules and grammars. The most successful near-native speakers and writers are those who have either learnt all the rules or been able to construct a high level of communication in the language themselves from an assimilation of the rules.

Computers are far less forgiving than a native speaker if the language is incorrectly communicated either through a misuse of syntax or a lack of vocabulary. Learning to programme a computer is therefore akin to having a hard taskmaster as a language teacher and a return to an instructivist approach. Computer programming cannot be learnt without regular and at times painful practice on a machine. The student must construct the language from the given rules because there is no comprehension by the machine of incorrect forms and an absolute necessity of creating error free code. This is a skill that cannot be learnt from listening to others nor by proxy but it must be undertaken personally, just like learning to speak or write a foreign language. An instructivist or associative approach (Mayes, 2004) works very well for this, but I would suggest that just like learning to communicate effectively in a foreign language the student could also construct their computer learning in a collaborative environment. There are plenty of examples of the 'lone programmer' stereotype, consequently can I justify the need for and the practical benefits of a constructivist approach to teaching and practising as a programmer? This may be possible for the skill of writing software, which can be completed as an individual in a personal environment, but where the numerous online help facilities add to the sense of community for the programmer who writes and compiles code at a distance. Computer Science is, however, much more than just learning to write computer programmes and much of the business of delivering IT

solutions to businesses requires students who can communicate requirements and solutions to complex problems. As a consequence much of my own teaching in recent years which has been in the areas of human computer interaction and strategic business systems development has encouraged a constructivist approach among students, where the ability to develop understanding is undertaken in groups tasked with finding a solution to a problem. I would maintain that there is still room for information giving and directive sessions in teaching but based on my experience and commitment to a constructivist approach to teaching these can be supported with plenty of opportunity to encourage students to collaborate and both construct their personal learning and co-construct their understanding. In this context, Laurillard's work on her conversational framework (Laurillard, 1993) has been one of the most helpful volumes to consider the practical nature of teaching in HE in recent years and has helped to transform my own ideas on practice as to how I can practically adopt a more constructivist approach with my students.

**2.2.4 Reflections on IT in HE – the mature student and the lecturer**

The process of becoming a mature postgraduate student after some years of secondary teaching gave me the opportunity to explore the impact of being taught again. As indicated in the section above, this experience was often just a throw back to my earlier university undergraduate experience of 'chalk and talk' or the 'sage on the stage' and a return to an instructivist method as a tried and tested means of imparting knowledge. My focus for that year of study was on achieving the necessary knowledge and gaining the expertise which I knew that I needed. I did not come across Chickering and Gamston's (1999) principles for good undergraduate education, until much later in my career but they would have been very useful

for my lecturers then to adopt and I have largely followed their approach since with my undergraduate and postgraduate teaching.

When I started to lecture at Hertfordshire following my Masters studies, I was determined not to drift back to the purely instructivist approach which I had left behind in my secondary school teaching and to present instead a more collaborative set of opportunities to students. I included these from the start with large group-based interactive seminar activities and on reflection I have realised that many of Chickering and Gamson's tried and tested principles support my own pedagogical approach[8]. There is however a balance to be found in combining the necessary presentation of new material in a lecture hall environment with the opportunity to promote discussion and collaboration among students, and engagement with their material.

## 2.3 The relationship of my reflection on learning and teaching to my EdD studies

The description of my own experiences as a learner and as a teacher have shown the developing journey in my practice in a range of pedagogical and technological environments. In this section I explain how this informs my thesis. I have chosen to investigate undergraduate students' experiences of using technology to support their learning from across a range of programmes at the University of Hertfordshire. I have in the process been struck by Barnett's comment on the student's sense of being and how this relates to their understanding of knowledge and find myself agreeing on multiple levels, from my own knowledge and from observing my own students, when he says that:

[8] These have recently been aligned with the work of David Nicol's REAP project (Nicol and Draper, 2009).

*'In relation to learning, ontology trumps epistemology. That is to say, the student's being in the world is more important for her learning than her interest in developing knowledge and understanding in a particular field. (Barnett, 2007: 6)*

My own experiences as a student learning a modern language and learning to program a computer were experiences which largely followed positivist and rule-based approaches. My research into descriptions of experiential learning has been expressed through this personal narrative of my development as a teacher, progressively adopting a constructivist approach to teaching spoken language and then encouraging collaboration among computer science students. This reflection has taken me through a set of experiences as a linguist, teacher, programmer and lecturer which provide a unique viewpoint and depth of analysis into the changes in pedagogy and associated technologies in the past forty years.

Can information technology be 'harnessed', in the words of a Department for Education and Skills report (Kelly, 2005), to create a transformative experience of learning and teaching to which the students respond favourably? Could this result in students engaging more with their learning and relishing the process of studying? I have already demonstrated this from the research I engaged in through my work for and prior to joining the Blended Learning Unit in the following examples (Barrett and Jefferies, 2005; Jefferies et al., 2005b; Jefferies et al., 2005a). However, I am now equally interested in the 'how' this happens as I have previously been in demonstrating 'whether' it happens. The ultimate aim of my research is to promote from the results of the analysis of the students' experiences investigated for my doctoral work a change in my own and other lecturers' practice. Further improvement of the design and support for our students' engagement with technology thus transforming their learning is the aim for my future practice!

## 2.4 Summary

This chapter has offered a reflection on my own experiences and my development as a practitioner through being a student and teacher, on both sides of the 'chalk face' to the point of adopting a generally constructivist approach to learning and teaching.

I have considered the changing pedagogical approaches which I have experienced as a learner and those which as a tutor I have adopted and the increasingly pervasive influence of IT on my professional practice. The use of IT, as we noted in the first chapter cannot be removed from the pedagogical experience and it is now perceived to be a ubiquitous part of everyday modern life. My reflections on my educational experiences have focussed so far on my school, undergraduate and postgraduate student experiences in two specific subject areas and the challenges of teaching these to a broad variety of young people. I have considered how the impact of changing pedagogy affected me on a personal level through these experiences. In the next chapter I explore how pedagogy has changed with the advent of IT in education and in particular over the last 15 years when internet technologies have made such a life-changing effect on the student experience in side and outside the university. Do we now need a new pedagogy for e-learning which will transform our students' learning, as the ubiquity of technology has changed the rest of their lives or is our existing pedagogy adaptable to the challenges of blended learning? This is the question addressed in Chapter Three.

# Chapter 3: Researching a pedagogical approach for Blended Learning

*'Experience is a relational concept: neither objective nor subjective, but expressing a relationship between a person and a phenomenon. Every experience is someone's experience'. (Ellis and Goodyear, 2010:102)*

## 3.0 Introduction

At the end of the previous chapter I considered the growing use of technology for a blended learning approach to teaching and learning in HE and I broached the question as to whether this would then require a new form of pedagogy. In this chapter I discuss recent research into pedagogical approaches to blended learning and then consider the arguments for and against the notion of a separate 'e-pedagogy', which could complement previous pedagogical theories.

I first explore, following my introduction of blended learning in Chapter One, how some of the early definitions of blended learning practice included a firmly held opinion on particular pedagogies (for example, Garrison and Vaughan, 2007). This resulted in some opportunities for confrontation, from those who were interested primarily in pedagogy rather than the use of technology to enhance learning. I then provide a review of perspectives of pedagogy and an introduction to some key writers. The themes of pedagogy and technology first considered in Chapter One are introduced again here since they will form the basis of the discussion for my chapter on the research design (Chapter Four) where I present the details of the matrix framework which encouraged student reflections on both their use of IT and the teaching approaches they experienced in HE. The framework previously introduced in Section 2.2.3 to illustrate my personal reflections was devised, pondered over and then

further revised in order to combine the students' experiences of pedagogy with the practical use of blended learning technologies.

This chapter's location in the framework of the thesis is designed to offer pedagogical perspectives for blended learning and at the conclusion of this chapter I offer an answer to the question posed at the end of Chapter Two: is our current pedagogy sufficient for a future where technology is ever present?

## 3.1 Pedagogy and technology

In the early material published about the nature and role of blended learning in this decade, there was a variety of sometimes opposing explanations as to what blended learning might be and whether the focus should primarily offer an approach to pedagogy or to present improved uses of technology. Much of this early research uses the umbrella term of e-learning since it pre-dated the notion of a blended learning approach or of combining IT and pedagogy. This e-learning literature provides a substantial background to the pedagogy/technology debate and it is included here to provide clarity and offer breadth and depth. It is worth noting that many of the papers written around the turn of the 21st century about e-learning and pedagogy, providing comprehensive surveys of the field of e-learning research just a few years ago, have themselves quickly become out of date as new technologies and further research have since moved in to take their place (for example Liber and Britain, 1999, and Squires et al., 1999). Latest research draws on the fast changing nature of technology in the classroom and often considers *inter alia* the use of pedagogy and games technologies (for example, de Freitas and Oliver, 2010; Whitton, 2009).

As we saw in Chapter One there has been extended discussion over what constitutes a blended learning approach with regard to the use of ICT for supporting learning and where

the overlap with e-learning might lie. There is, I suggest, a need to define the pedagogical approaches to blended learning. Accordingly some of the writers on BL have suggested that it is a definition of the blended pedagogy which is needed. In this section I first review the explanations from two writers about how a blended learning pedagogy might be defined. I then explore the views of Oliver on the need for an e-pedagogy to accompany a BL approach. Finally I examine the proposals from Smart, Mayes and de Freitas for drawing together the ways different pedagogical perspectives can be used with BL to enhance the student learning experience.

Firstly, Valiathan proposed a useful definition of blended learning in 2002 acknowledging that the use of the term BL could imply a pedagogical approach as well as exploring the types of technology used:

> *'The term blended learning is used to describe a solution that combines several different delivery methods, such as collaboration software, Web-based courses, EPSS, and knowledge management practices. Blended learning also is used to describe learning that mixes various event-based activities, including face-to-face classrooms, live e-learning, and self-paced learning'. (Valiathan, 2002)*

Her approach suggests multiple styles of teaching and learning using a wide variety of contents in the blend with no specific pedagogic style proposed. Whitelock and Jelfs (2003) in their editorial for the Journal of Educational Media's Special Issue on Blended Learning proposed three further definitions of blended learning and its relationship to pedagogy:

1. The integrated combination of traditional learning with web-based online approaches, which drew on the work of Harrison (2000).

This has now largely diversified into two areas, namely the use of commercial organizational online learning design (see *inter alia* Collis and Moonen, 2005) and the

model taken up by many academics when working with their VLE/MLE and campus-based students.

2. The combination of media and tools employed in an e-learning environment.

This is less clear-cut in its description and for my purposes does not consider how pedagogy may be affected nor is the balance of the campus-based materials and activities drawn in to the description.

3. The combination of a number of pedagogic approaches, irrespective of learning technology use, which drew on the work of Driscoll (2002).

Driscoll's approach draws on a separate research literature on learning and teaching styles and a mixing of approaches which might be adopted by those embracing the use of IT for designing and supporting student learning. This view has been dismissed as being inconsistent by Oliver and Trigwell (2005) because it attempted to draw together too many incompatible theories of teaching and learning under a single umbrella of blended learning.

Later and continuing the arguments he had addressed with Trigwell above, Oliver in an editorial for ALT-J (Oliver, 2006) returned to the themes of pedagogy and technology when he asserted that:

*'The question of how technology affects pedagogy is not new, but has started to become a focus for attention again…What is different, this time around? The promise of technology to revolutionise teaching has a long-established history that seems to have failed to materialise. In the mid-1950s, Skinner proposed the idea of the teaching machine… And yet we are still trying to understand this relationship between technology and learning.'*

Complementing Oliver's contribution to the debate and providing a visual dimension to understanding the sometimes acrimonious discussions between technology and pedagogy, the cartoon reproduced below (Figure 3.1) appeared on an e-learning website, (JISC e-Learning Focus) accompanying an article by Smart to illustrate her view that: '*Too often technology dictates which options are available to practitioners using e-learning.'* (Smart, 2005)

This cartoon epitomised for many who were well established in the field of higher education pedagogy what appeared to be a growing tension between technology and pedagogy. This may be described more helpfully as a fear of an overwhelming impact of technology on the established field of educational practice which could neither keep up nor had time to reflect on what change there should be, if any, to tried and tested pedagogical approaches. The debate was not helped by those who placed themselves on the technology front who were perceived to be pressing ahead for a greater acknowledgement of how the current generation of students entering HE were changing their learning patterns when offered the possibility of using more and more technology to support their learning. An example of this was the research coming out of the U.S. in the middle of the decade such as the work of Educause from the Oblingers, which was seen to be pushing for a rapid acceptance of the need to review attitudes to technology use:

> *'Higher Education must continue to engage the Net Generation in a dialogue regarding its expectations about technology and learning to assess how wide the window of opportunity may still be as well as how quickly it may be closing.' (Oblinger and Oblinger, 2006)*

Figure 3.1 therefore offers a provocative discussion starter regarding the impact that technology has on education. One explanation of the cartoon suggests a visual metaphor

showing the Giant of Technology who is dragging a reluctant, human sized 'Education' behind as he speeds at great pace across an unidentifiable landscape. Education is hanging onto the boot of the Giant Technology in an effort to either keep up or be pulled along for fear of losing touch altogether.

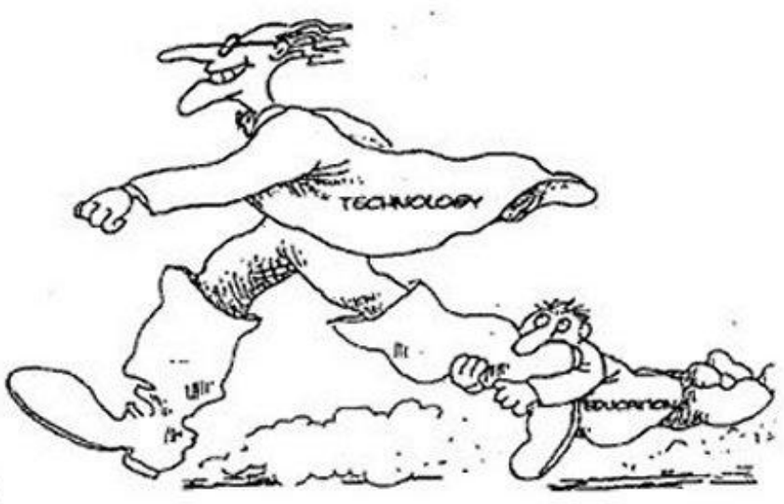



**Figure 3.1 The Education/Technology cartoon as cited by Smart (2005)**

An alternative explanation is that the giant is striding into the future unaware of destination or environment and thus the consequences of his action and so Education is attempting to hold him back from danger. The illustration offers an interesting multi-faceted impression of what the 'Giant' Technology might be like; it is of course highly anachronistic to portray Technology as an old-fashioned storybook-style giant and to portray two male figures. Technology does appear in the former view to be less concerned to have Education keeping up with him than the other way around. In the latter view he is ignoring him. Whichever of the explanations might be correct or neither, the certain outcome is that Technology and Education are not being portrayed as friends setting off amiably on a journey together. The wariness of some educationalists regarding blended learning is confirmed when they have

anecdotally told me that they claim to be quite uninterested in technology and see it as having no relevance for them professionally at all. According to Moore's classification of attitudes to technology among the population of users (Moore, 1991) these latter proponents might be termed as the 'laggards', as opposed to the 'early adopters' [of technology for learning] or the 'late majority' of technology adopters; that is, they are those who have no interest in the use of technology in their classroom and would prefer not to engage with technology in the future. However, such an approach, while temporarily comforting to those who may struggle to use IT, will not solve the long-term issues of using technology to enhance the learning experience. The pictorial representation of Education struggling to keep up with an impersonal and disinterested Technology draws parallels from the perspectives of teachers' experiences at all levels. Some of the questions which this raises are: Is pedagogy always struggling to keep up with technology? Should pedagogy care about keeping up with technology? Is technology *insouciant* of pedagogy's concerns? The perception that technology needs to be kept under control by pedagogy was perpetuated by the choice of title for the Department for Education and Science paper, 'Harnessing technology', which demonstrated how technology might be used fruitfully in the school classroom, although its primary aim was more conciliatory: *'We need to listen to people's views and ensure that technology meets their needs.'* (Kelly, 2005)

Gilly Salmon who has written extensively on offering a balance, as opposed to a possible confrontation between pedagogy and technology proposed that:

> *'Learning technologies are used in new ways, to advance beyond* ***what was possible in the classroom*** [my use of bold] *or to combine traditional approaches with e-learning in effective and worthwhile modes to meet new objectives and purposes of teaching and learning.' (Salmon, 2005:202)*

Furthermore, she advised that the technologists should not merely concentrate on having a single set of technologies to create a successful balance between pedagogy and technology:

*'No VLE will ever be enough in itself to create great e-learning '(Salmon, 2005: 203).*

Some of the foremost research in the area of pedagogy and technology was carried out by Mayes and de Freitas who in their extensive e-pedagogy frameworks study for JISC (Mayes and de Freitas, 2004) suggest that aligning theory, pedagogical approach, learning outcomes, teaching methods and assessment provides the best chance of achieving effective learning experiences for students. They assert that:

> *'Although learning theory is often presented as though there is a large set of competing accounts for the same phenomena, it is more accurate to think of theory as a set of quite compatible explanations for a large range of different phenomena.' (Mayes and de Freitas, 2007:14)*

Their work has been discussed widely in the e-learning arena and provides both a review of relevant learning theories to build on and a consideration of how technology and pedagogy may be complementary instead of opposing, such as Draffan and Rainger's (2006) model for challenges for BL from the learner and teacher perspective. This is discussed in more detail in the following section.

## 3.2 A set of pedagogical theories

In this section I continue in greater detail the introduction to pedagogical theory which I started in Chapter Two. Mayes and de Freitas (see the previous section) describe a set of perspectives on learning based on Greeno et al.'s earlier work (1996) amongst others of three broadly different perspectives on learning. These are an associative (or instructivist) approach, a constructivist approach and a situative approach. I discuss these below and describe why I have further separated out the use of a constructivist approach into both

individual and social constructivism. Each theoretical perspective implies a different set of teaching approaches or practice models.

As I explore these I propose that they can represent a continuum of developing pedagogic theory in line with Mayes' comments quoted above. This is not to assert that there are no other ways to represent pedagogic theory but I want to show that in line with my own experiences as the school child, the student, the secondary teacher, the postgraduate student and latterly the lecturer in HE, students can experience multiple styles of pedagogy whether an instructivist (or associative) or situative approach. Cognitivism, which is also discussed as the constructivist approaches, holds what I would describe as a middle position between the other two approaches in terms of knowledge exchange from either a one to many perspective (instructivist approach) or a many to many perspective in a situative approach.

I have reproduced Smart's table below which is based on the Mayes/Fowler and de Freitas work. This serves as a visual way to demonstrate the key differences between these four approaches to learning and their underlying pedagogical perspectives. In this chapter I am only going to discuss the perspectives, reporting the research base for the assumptions and a brief summary of the associated pedagogies (see also Smart, 2005). Later in Chapter Seven I discuss the outcomes from how the blended learning pedagogies were experienced by undergraduate students in the study and how this might be applied to practice for the educator in HE.

Table 1 Defining approaches to learning from the Effective Practice with e-learning Guide, based on earlier work by Mayes, 2004 © HEFCE, 2009

| Perspective | Assumptions | Associated Pedagogy |
|---|---|---|
| **The associative/instructivist perspective** | Learning as acquiring competence<br>Learners acquire knowledge by building associations between different concepts.<br>Learners gain skills by building progressively complex actions | • Focus on competence<br>• Routines of organised activity<br>• Progressive difficulty<br>• Clear goals and feedback<br>• Individualised pathways matched to individual's prior performance |
| **The constructivist perspective (Individual)** | Learning as achieving understanding<br>Learners actively construct new ideas by building and testing hypotheses | • Interactive environments for knowledge building<br>• Activities that encourage experimentation and discovery of principles<br>• Support for peer review, reflection and evaluation |
| **The constructivist perspective (Social)** | Learning as achieving understanding<br>Learners actively construct new ideas through collaborative activities and/or through dialogue | • Interactive environments for knowledge building<br>• Activities that encourage collaboration and shared expression of ideas<br>• Support for peer review, reflection and evaluation |
| **The situative perspective** | Learning as social practice<br>Learners develop their identity through participation in specific communities and practices | • Participation in social practices of enquiry and learning<br>• Support for development of learning skills<br>• Dialogue to facilitate the development of learning relationships |

### 3.2.1 The associative/ instructivist approach

The associative approach to learning considers that learning is '*acquiring behaviour through defining sequences of component to composite skills,*' (Mayes and Fowler, 2004:13) and the *'gradual building of patterns, associations and skill components'* (ibid). The teacher's expertise lies in designing instruction and the outcome is typically that a set of skills,

concepts or behaviours is learned. According to this perspective people learn by association, this could lead to accuracy of reproduction as in for example the memorising of facts, via mnemonics or the training of memory. As such this theory of learning can be traced back thousands of years to times when there was no written support for learning knowledge and facts, and everything had to be committed to memory through oral traditions. The modern version of the theory is less concerned with how concepts or skills are represented internally but in how external behaviour is shown and modified. There is little attempt to justify a sense of 'deep learning' (Biggs, 2003), and one of the criticisms of this theory of learning is that it can require memorisation rather than understanding and application. Generations of school children learning French verbs pre-1970 (and afterwards too) can acknowledge that they learnt much by rote which they can recite years later but that they did not always understand how to apply their learning. The *associative* term has more recently been described as both an 'instructional perspective' which builds on the work of Gagné (2004) and his instructional systems design (ISD) and with the approach defined as *'behaviourism'* (cf Skinner, 1965) but this latter term with its undertones of control and power (as seen in the critical perspectives of his work by *inter alia* Habermas, 1992; Freire, 1970 and Foucault, 1971) has fallen out of favour in recent years.

Jordan et al. however suggest in favour of an *associative* approach that: *'Education has always had the modification of behaviour as one of its main purposes'* (2009:27).

Mayes and de Freitas assert that some of the actual teaching that takes place in HE has more in common with associative approaches than the constructivist views advocated by many and including Garrison and Vaughan. When offered a choice of approaches to their learning a number of the students who later took part in the interviews for this research

identified both being taught in this way and expressing a preference for this instructivist perspective. This was on the basis that they felt more comfortable sitting in a lecture and taking notes than in seeking out the material with a group of peers themselves. They said that they could 'trust' their lecturer to provide the right information in a way that was economical for them to acquire.

### 3.2.2 The constructivist approach

A constructivist approach is one where learning is understood as *'achieving understanding through active discovery'* (Mayes and de Freitas, ibid: 221). The constructivist approaches to pedagogy are drawn out from the umbrella term of cognitivism. This approach to learning developed from the 1960s onwards, following a general shifting in *'theoretical positioning in psychology'* (Mayes and de Freitas, 2007: 16). While the *associative* approach depended on memory and breadth of learning of facts for acquiring knowledge, the developing theories on constructivism suggested that understanding is gained through a more active approach to learning where hypotheses are created and tested and from this a personal expertise and knowledge is built. One of the earliest influences for a constructivist approach in school-based learning was Piaget (1970). Following his extensive research he proposed that conceptual development occurs through intellectual activity rather than through the absorption of information. Bruner's (1960 and 1966) interest in child psychology on the other hand led him to propose learning as an active constructive process where learners are directed to construct new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions, relying on a cognitive structure to do so. This active approach to learning would be taken up later by theorists seeking examples of 'deep' as opposed to 'surface' styles of learning

(Biggs, 1999). In practice the principle of individual constructivism is that people learn by actively exploring the world around them. Kolb's (1984) cycle of experiential learning is a typical constructivist approach to learning. From the 1990s onwards, greater emphasis would be placed on the development of 'problem based' approaches to learning in HE. In reflecting on my own learning experiences I can trace back the move to a more constructivist style of learning, which was being encouraged as I undertook my PGCE in 1976 and already in evidence in some of the schools I visited. Later I would personally adopt a constructivist approach in order to engage my own pupils to actively explore and practice foreign language speaking through paired conversation work, among other activities, but with hindsight this was more of a social constructivism than an individual constructivism.

A separating out between an individual and a social approach to constructivist principles of learning allows for a definition of social constructivism that includes *'learning as achieving understanding through dialogue and collaboration.'* (Mayes and de Freitas, 2004:221). Duffy and Cunningham (1996) propose a distinction between the cognitive constructivism of Piaget and a socio-cultural constructivism derived from the work of Vygotsky and his description of a Zone of Proximal Development (ZPD). The general theory here is that the individual discovery of principles is heavily scaffolded by the student's social environment; the term 'scaffolding' arose from the influence of theorists such as Vygotsky (1978) who emphasised the importance of social interaction for developing higher cognitive functions. Vygotsky's work was based largely on his study of the education of children and he proposed the idea of the 'zone of proximal development', defined as:

> *'…the distance between actual development as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers' (Vygotsky, 1978:86)*

His 'ZPD concept' underpinned a process for suggesting a child's future individual performance by exploring his or her level of problem solving ability whilst interacting with, or steered by, others. He developed this from the observation that when working with more able others, a child is able to perform better than when working alone. Vygotsky developed this recognition of the importance of working with others, saying *'human learning presupposes a specific social nature and a process by which children grow into the intellectual life of those around them'* (Vygotsky, 1978:88).

Further theories were developed within the fields of learning psychology and pedagogy, including the theories of collaborative learning, drawing on the interest of many people in the learning potential of students working together. Collaborative learning was considered to involve the *'mutual engagement of participants in a co-ordinated effort to solve the problem together' (*Roschelle and Teasley, 1995:8).

The work of Pask and Laurillard, exemplified in 'Rethinking University Teaching' (1993) in the development of their 'conversational framework' has been highly influential across the HE sector in the past nearly 20 years and could be placed confidently under the banner of social constructivism. They, in company with other social-constructive theorists, emphasize the importance to the learning process of social interaction.

### 3.2.3 A situative approach

A situative view of learning is defined within the context of developing practice within a particular community. Students learn by participating in a community, progressing from being a novice participant to an expert one through observation, reflection, mentorship and a commitment to working in accordance with the community principles. Lave and Wenger have been the key researchers for their development of practice by and for a community

with their Community of Practice model (1991 and Wenger, 1998). The important distinction between this approach and that of a social constructivist approach is the linking of the student's learning with the current or future community within which they practice. Study and practice should not be separated and are indeed specifically encouraged through opportunities for authentic work-based learning and continuing professional development. While I have agreed with Mayes and Smart in their proposal that Lave and Wenger's work on Communities of Practice would be included at the situative point, it could be argued that this is an extreme form of social constructivism.

When the student interviews reported in Chapter Six were conducted I was intrigued to find two examples from the small group of students who were keen to describe how they had set up their own working communities for support and encouragement and for sharing expertise across the members. The examples included one group of students (see Hannah's experience in 6.3.2) which had joined the university together from an FE Foundation programme and were now following different but linked modular undergraduate programmes. In order to provide each other with study support from their mixture of background and skill sets they enabled the novices among them to become more skilful and operated a kind of matrix structure where different experts provided help in different situations. The community of practice here was related to their undergraduate programmes in technology, the outcome was a synergy where the less able were raised to a higher level of achievement than they would otherwise have gained without their practical community. This was a voluntary enactment of what often occurs in group work assignments imposed in the classroom setting and additionally a serendipitous example of Vygotsky's zone of proximal development being worked out through student support in a voluntary capacity.

The three main perspectives for approaching learning discussed in this section provide an analytical framework to the research into pedagogy for blended learning, debated across the sector and which is now summarised in the penultimate section of this chapter.

## 3.3 Reviewing the e-pedagogy question

As outlined above there has been much debate on the pedagogy and technology question over the past ten years but it is clear that technology is now an established feature of most HE environments whether this includes a purpose-built VLE/MLE or not. Biggs, in the second edition of his book 'Teaching for Quality Learning in Higher Education', had already noted that: *'Educational technology is no longer a 'gee-whiz' toy for geeks. It has established a place in the normal delivery system of most universities, whether on or off-campus'* (2003: xi). A few years later Sharpe and Benfield noted that: *'Technology use has now become so prevalent in the lives of undergraduates that decisions about whether to use technology or not no longer seem relevant.* (2006:74).

In 2006 Oliver commented on the pedagogy/ technology issue:

> *'Which is more naïve: To look for an effect of technology on learning or to assume that there will be none? ... our analysis suggested that, for these people, teaching with a new medium was the same and completely different simultaneously. It all depended upon how they framed teaching. This is the situation we have now reached with research. If there is progress on this topic, it has been to recognise the complexity of the problem, rather than to provide a simple answer' (Oliver, 2006:133).*

Oliver's phrase *'it all depended on how they framed teaching*' in my mind captures the kernel of the debate regarding pedagogy and technology.

Consequently, I suggest there is a wide-ranging agreement on the changing nature of the pedagogical environment which has been affected by the rapid growth and ready availability

of digital technologies since the start of the decade, while acknowledging that there is a complexity in understanding how technology influences pedagogy.

However, are we trying too hard to identify a separate style of e-pedagogy? A short survey of so-called 'e-pedagogy' sites online revealed that too often e-pedagogy is taken merely as a short-hand for e-learning but that even those who have thought more seriously about the issue are unable to propose a unifying statement defining e-pedagogy beyond the point that it is a 'pedagogy for e-learning'. Many researchers, myself included are now coming round to the view of Mayes and de Freitas who asserted that: *'It is arguable that there are no theories of e-learning, only e-enhancements of existing models of learning'* (Mayes and de Freitas, 2008:13). I suggest Mayes is well placed to survey the territory from his prodigious research output on learning technologies from 1990 through to the present day and much of the recent research work carried out for the JISC also accords with this viewpoint as described in ' Effective Practice in a Digital Age' :

> *'Effective practice in a technology-rich context comprises a skilful combination of long-established and more innovative strategies in order to engage and empower learners and make learning more accessible, participative and rich.' (JISC, 2008:9)*

The debate has been expressed even more simply however. Considering the student experience point of view, Masterman et al. expressed the point as: '*Students learn, they do not e-learn.'* (Masterman et al., 2010). This simple statement acknowledges from their research with post-graduate students in Oxford, that students learn in multiple ways and may be assisted or hindered by the adoption of a pedagogical perspective by their teacher. This is just as Tyler had suggested many years previously: *'Learning takes place through the active behaviour of the student:* '*It is what he does that he learns, not what the teacher does,' (Tyler, 1949, quoted by Biggs, 2003 in the foreword).*

## 3.4 Summary

This chapter has introduced some more of the research into approaches to blended learning and shown the potential for tension between the twin dynamics required for a blended learning environment, the information technology and the pedagogy. I have suggested that a resolution to this tension comes from identifying that through the many pedagogical perspectives which have been chosen and applied by practitioners, there may be some more suited to a digital age. In the end, however, regardless of the prevalence of technology and the choices open to them, lecturers and students make their choices from what is available to them. There are challenges for both the teacher and the taught but IT has been clearly enhancing the processes and opportunities for learning for many years. Biggs proposes that: '*There is no single, all-purpose best method of teaching. Teaching is an individual matter.'*(2003:2)

Mayes and others conclude that there is no need for a separate style of e-pedagogy since all the pedagogical perspectives presented here can be used with or without technology. They assert therefore that there is a developing model of technology-enhanced education rather than a new e-pedagogy.

> *'...in the powerful new learning opportunities that are being facilitated in an entirely new way through the Internet, we are beginning to witness a new model of education, rather than a new mode of learning.'(Mayes and de Freitas, 2008:14)*

In conclusion, therefore it is up to the academics to make their wise choices from what is available and to ensure that where online technologies are used, this is as far as possible with the intention of enhancing or transforming the student experience. A key point from this chapter is that technology is now being used widely to enhance learning but this new

model of education does not require a whole new direction for pedagogy as will be seen in the findings presented in Chapters Five and Six.

# Chapter 4: The Research Design – Developing my research methodology

*'We talked of many things …Of methodologies and frameworks, of paradigms and things.' (after Lewis Carroll, Alice in Wonderland)*

## 4.0 Introduction

As outlined in Chapter One, the purpose of my research is to investigate undergraduate students' experiences of their use of technology to support their learning. There are three core themes which run through the narrative of my research into blended learning; these are the student, their study in HE, and the use of information technology to support learning. In Chapter Three I explored the growing literature on pedagogy and the use of technology to support learning in HE and came to the conclusion that there is no single new e-pedagogy for learning in the 21st century.

In this chapter I concentrate on two main areas. First of all, in section 4.1, I present how my research methodology has been developing through my own research career across my three themes up to and including the current research design for my doctoral work. Then in section 4.2, I discuss the trustworthiness and reliability of the research. Secondly, in section 4.3, I explore further how and why I developed my conceptual framework, comparing and contrasting it with some recent designs.

I reflect here on the earlier research philosophies and hypotheses I adopted and how my current research has moved into using a mixture of approaches and so I have subtitled this chapter 'Developing my research methodology' following Somekh and Lewin's description of methodology as both '*the collection of methods or rules by which a particular piece of*

*research is undertaken'* and *'the principles, theories and values that underpin a particular approach to research,'* (2005:346).

The reference to Lewis Carroll is used because the progression in my research to my current stance has been the result of many discussions and much reflection. My aim in my research has been to accurately establish the experiences of the many students who have spoken about their learning in HE over the past four years. Thus I have sought to justify my choices, from among the many possible options, for a methodology and research methods which can effectively describe their views and experiences.

## 4.1 The research journey – mapping the process

My previous research developed from my background as a lecturer in a computer science academic community which broadly adopted a 'positivist'[9] approach to researching both the content and the practice of its teaching material (see for example Bennett et al., (1997); Britton and Jefferies, (1998); Baillie and Jefferies, (1999); Egan and Jefferies, (2006)). I described in Chapter Two my reflections on the changing use of pedagogy to accommodate new technologies and my concern within my own academic practice that the student experiences of HE should contribute to their learning and equip them for the future. This has led to a shift in my personal research approaches from a view of measuring quantitative outcomes of student focussed research to a personal impetus to research the students' own descriptions of their experiences of how they learnt.

[9] Positivism, also referred to as the *'scientific method'* or *'science research'*, is '*based on the rationalistic, empiricist philosophy that originated with Aristotle, Francis Bacon, John Locke, August Comte and Emmanuel Kant'* (Mertens, 2005:8) and *'reflects a deterministic philosophy in which causes probably determine effects or outcomes'* (Cresswell, 2003:7). Thus a positivist approach would *'test a theory or describe an experience through observation and measurement in order to predict and control the forces that surround us.'* (O'Leary,2004:5)

My first foray into publishable research was in the 1996/97 academic year when I embarked on a study of first year undergraduate computer science students to determine whether early intervention of a personal tutor, within the first six weeks of the first term, following a set of cohort wide tests, was likely to make any difference to whether they passed or failed their first year at university. The design of the project from aims to methodology to the writing of papers was made from a positivist view of scientific design and sought only to include quantitative data. The data for that study was collected primarily by the personal tutors then carefully analysed and finally presented as a series of tables of statistical data with a summary containing well-argued conclusions (Crouch et al, 1998).

In the early 21st century I received funding through the University's learning and teaching awards fund for two projects to investigate the staff and student experiences of the university's new (at that time) MLE, StudyNet, which was introduced in pilot form in 2001. These were also largely quantitative studies seeking to analyse large amounts of data from questionnaires, with a small number of additional qualitative responses. I was introduced to the notion of using focus group data to investigate the spoken experiences of participants (Thornton et al,2003).These were my first experiences of using a mixed methodology approach and of considering the challenges of analysing qualitative data.

The progressive shift in my research base is seen in the papers from this time (Thornton et al., 2002; Bricheno et al., 2004; Jefferies et al., 2004b) to the point where the aim of my current research has been to consider data gathered from students' opinions of their use of learning technology. This personal research journey has developed from a purely 'positivist' paradigm and quantitative approach in the late 1990s, through my research in the early years of this century and then my role as evaluation coordinator for BLU to the approach

adopted in this research which focussed on the gathering and analysis of much qualitative data.

Within the literature I found a means to document my own 'Research Journey' process with Mackenzie and Knipe (2006). Their framework has provided a suitable guide, to continue the earlier metaphor, on which to build the explanation of my approach. For a researcher moving from the quantitative to a qualitative approach it was a useful process to follow for ordering my thoughts and determining the choices to make in my research design. On reflection I had adopted a constructivist attitude to my teaching early on but my own research approach had remained almost exclusively 'positivist' for several years more.

Crotty asserts that '*We have to devise for ourselves a research process that serves our purposes best, one that helps us more than any other to answer our research question*' (Crotty, 1998:10). In developing my understanding of research methodologies and making my decisions as to how and what to pursue in terms of determining a paradigm and framework with which I was comfortable and which supported my preferred area of interest, I have relied on the framework of a 'research journey' as being particularly useful, since it helped to identify and then document the decisions which needed to be made regarding research design. This was explained by Mackenzie and Knipe as follows:

> *'The intention of the framework was to 'assist …researchers make considered decisions about the type of study they undertake, the process involved in undertaking a research project and the debates in the literature surrounding theoretical frameworks underlining research,' (Mackenzie and Knipe, 2006: 193).*

Below, I reproduce and then apply a version of their eleven step framework in order to examine and reflect on how my decision making developed through my doctoral studies: *'…*

*to situate paradigms, methodology and data collection tools within the research process' (ibid:202).*

The 'research journey' framework is represented here as Table 2, which provides a simple structure with which to engage. I have included the authors' final 'actions and options' column for clarification of what each step should consider and then within each step I identify the decisions which I took and then give below my reasons. However, as I reflect at the end of the section in a short critical review the simplicity of the framework can be described as disingenuous since it hides the necessary iteration and pauses for consideration which each stage of the research process requires. Some stages have been concatenated in my description for ease of explanation.

**Table 2 The Research Journey (after Mackenzie and Knipe, 2006:203)**

| Step | Description | Actions/Options suggested by Mackenzie and Knipe | My own choice explained below |
|---|---|---|---|
| **Step 1** | Start with a broad view of the discipline and or the paradigm you see as suiting the research | Positivist or post-positivist<br>Interpretivist/constructivist<br>Pragmatic<br>Transformative | Interpretivist/ constructivist |
| **Step 2** | Determine area of investigation | | |
| **Step 3** | Identify approach | Action,<br>Case study,<br>Experimental<br>Field study, *inter alia* | Case study |
| **Step 4** | Conduct literature review | | |
| **Step 5** | Determine data types | Quantitative<br>Qualitative<br>Mixture of quantitative and qualitative | Mixed – mainly qualitative with some quantitative |
| **Step 6** | Choose data collection instruments/methods | Document analysis<br>Experiments<br>Focus groups<br>Interviews<br>Observations<br>Surveys *Inter alia* | Stage 1: Student constructed video and audio diaries<br><br>Stage 2: Semi-structured interviews |
| **Step 7** | Identify where, when and who data will come from | Including developing or identify data collection tools<br>Trialling data collection tools<br>Refining data collection tools | |
| **Step 8** | Obtain Ethics Approval | Determined by type of data and source of data | Agreed |
| **Step 9** | Data Collection | Includes storage and management<br>Organising and sorting<br>Coding and displaying | See below<br>Diaries: Transcription, content analysis of themes |
| **Step 10** | Analyse the data | Thematic analyses<br>And/or statistics may be leading to further data collection | Interviews: Transcription, content analysis of themes |
| **Step 11** | Write up findings and conclusions | Return to the literature | |

### 4.1.1 Finding the research paradigm

The theoretical framework with the assumptions and beliefs that together underpin a research study is the paradigm (Robson, 1993). Mackenzie and Knipe assert that *'it is the choice of paradigm that sets down the intent, motivation and expectations for the research.'* (2006:194) and suggest that there are four research paradigms as shown in Table 2 above. Other writers such as Lincoln and Guba (2000) describe five possible research paradigms. My own research journey as described earlier demonstrated a shift over the course of the last ten years from a purely 'positivist' view as regards a paradigm to one that has become more interpretivist/constructivist in approach. This development has arisen as a result of my interest in studying different types of student experience and also from the influences I recorded in my reading about the research approaches adopted for similar areas of student experience research (Thornton, 2009, Alltree, 2009). Finally, it was after reading about Creanor's particular use of interpretive phenomenological analysis (IPA) (Creanor et al., 2006) that I realised how appropriate an interpretive/constructivist approach could be for my own planned doctoral investigations.

The constructivist paradigm which is also sometimes called the interpretivist paradigm[10] is concerned with how people construct meaning and theory. Alltree (2009) suggests that the constructivist paradigm is one of a number of interpretivist paradigms. Thornton commenting on her own work in investigating healthcare students' use of collaborative learning asserts that: '*The nature of [her] study - the student's experience, is more appropriately investigated by an interpretive perspective... The students' experience is but a story from that individual's perspective,'* (Thornton, 2009).

[10] Miller and Crabtree (1999) argue that using the dual name as Mackenzie and Knipe do can cause confusion between the research paradigm and the approach to the analysis of the data.

From an epistemological perspective a constructivist approach recognises that the researcher sets out to understand the human experience from the participant's perspective and that the outcome from the research is a joint understanding of what in the case of my doctoral studies are the students' multiple perspectives of their learning experiences, (Denzin and Lincoln, 2000, ch1). Richardson (1997) suggests that this view is akin to seeing the outcomes of the research through a prism, so that instead of seeking to triangulate the research outcomes using a 2-dimensional metaphor, they are crystallised and can appear in many dimensions, while offering 'symmetry and substance'.

Within the interpretivist/constructivist paradigm there are a number of criteria which have been put forward to judge the value of the research findings; these key components are: credibility, transferability, dependability and confirmability, (Lincoln and Guba, 1985; Robson 1993: 402-407) and I will address these in greater depth below, when considering the details of the research design.

I have therefore been attracted to the interpretivist/constructivist paradigm since this has the *'intention of understanding the world of human experience'* (Cohen et al., 2000:36) and because of the relationship of my planned work to Cresswell's assertion that the interpretivist/constructivist researcher: '*relies upon the participants' views of the situation being studied,'* (Cresswell,2003:8). Working within the broad constructivist paradigm, I am necessarily very aware of my own place in the research that is, that my background in technology and commitment professionally to a blended learning approach may impact upon my own viewpoint and this will be explained more fully in the section 4.1.9 on data gathering and analysis.

I referred above to my adoption of a broadly constructivist approach, but the personal journey to this point means that I had considered and experimented with a variety of research approaches. Alltree asserted that '*researchers have to be pragmatic*' (2009) and that there is a possible tension between research theory and research practice. At what point do the practical needs override the theoretical considerations? By adopting a pragmatic approach to my research, however, I believe it has given me the opportunity to make a choice of methodology according to the needs of the research problem, while allowing an investigation of the voice of the student participants who have constructed the data, to be kept centre-stage. Stake (2000) argued that defining the case and using appropriate methods according to the needs of the study are more important than the high level methodological considerations and Denzin and Lincoln (2000) describe the researcher who works with more than one method or even more than one paradigm as a *bricoleur*, from the French for a handyman, who uses multiple tools according to the purpose of the project[11]. They go on to describe two types of *bricoleur*; the one who works within one research paradigm, the *theoretical bricoleur* and the one who works within several possibly competing paradigms, which they call the *researcher-as-bricoleur*. Mackenzie and Knipe also justify this multiple tools approach when they write that:

> *'More recently research approaches have become more complex in design and more flexible in their application of methods with mixed-methods becoming more acceptable and common'. (Mackenzie and Knipe, 2006:194)*

Gorard and Taylor further assert that *'combined or mixed-methods research has been identified as a key-element in the improvement of social sciences including educational research' (Gorard and Taylor, 2004:7).*

[11] Levi-Strauss has been dismissive of the use of the term *bricoleur*, alluding to him/her as a myth-maker (*La Pensée sauvage* (1962, The Savage Mind, 1966) but in my opinion it is an appropriate term to use in regard to my own research approach.

So my research adopts overall an interpretive/constructivist approach for its paradigm while using the *theoretical bricoleur's* approach of choosing from multiple tools for data gathering and analysis within my research design.

### 4.1.2 Determine the area of investigation

I identified and discussed above my search for a relevant paradigm for researching aspects of the undergraduate students' experiences of learning and their use of technology. Later I explain how and why I decided to use various data gathering methods with a justification for the specific method chosen for gathering primary qualitative data which is the use of personal reflective diaries. In this section I present a narrative showing the development of my area of investigation as it grew out of my own practice based in the Blended Learning Unit.

The development of my doctoral work in particular, arose from one of the studies I worked on during my secondment to the BLU, as it provided an excellent opportunity for piloting some of the research methods I was later to use. At the time, through 2005 and 2006, I supported a number of ongoing projects which considered the different aspects of the learner experience, but it was the decision to invite students to reflect on their experiences of learning in a purposeful way over a defined period of time which particularly captured my interest. A small group of colleagues devised a week of student-recorded video projects which we termed 'Seven Days in the Life of a Student.' (Quadri et al., 2007; Jefferies et al., 2007). The objective was to find out via these 'student–led' reflections, how the students studied day-by-day within the broader blended learning environment of the university and how important technology was for supporting their learning. We worked with the University of Hertfordshire Students Union to devise a set of daily questions for the students to answer

to ensure that they produced a set of timely and appropriate reflections and then sent out a dozen volunteer students from different undergraduate programmes with a camcorder for a week during term-time. The resulting tapes were carefully watched and transcribed and analysed to find out about their experiences. The data was rich and informative and fascinating to watch, as the students on the whole followed their brief clearly and produced some wonderful reflections on how they used their time and how much technology they used day by day.

The research design was to gather qualitative data in what was at the time considered to be a brand new method; students using camcorders to construct daily reflections, and to present the highlights of the analysed and edited student videos as part of the dissemination process for the work of the BLU.[12] We also drew on the outcomes to inform policy and practice in the use of technology to support student learning and in the use and design of our own learning spaces at the university. Here in this mini-project was some insight into the authentic student voice, since this data did not readily 'fit in' with the other types of student feedback via organised questionnaires, interview or surveys. Students at the University are very often given surveys to complete both throughout the year and at the end of a module. Quantitative data from survey questions with a limited set of answer possibilities has many uses statistically but there are inherent disadvantages of survey questions as a form of qualitative data gathering. One disadvantage of this form of interview data gathering is that it constrains the participants' responses since the opportunity for free form answers is generally very limited because of the statistical methods typically employed to analyse quantitative data.

[12] The ethical considerations of this work were carefully thought through to start with and are discussed later. The ethical use of video material was discussed in detail with the Chair of the Ethics Committee at the University

This ‘Seven Days’ project ultimately turned out to be a very useful pilot for my future EdD research design because it identified both the strengths and weaknesses of following a process which involved the gathering of ‘qualitative data’ from interviews and recordings. The area of that research (the capturing of a genuine student-voice) was clearly identified and the process of the data collection was determined as an experiment in the use of camcorders. The data analysis would in the end present a major challenge since the team’s enthusiasm to experiment with a project involving active student participation ably assisted by the Students’ Union, was not fully thought through. The week-long sets of student reflections resulted in unexpectedly large quantities of data for analysis. In retrospect, this project taught me the importance of working through in advance a framework such as Mackenzie and Knipe’s to consider where I was going in the research design and what I might do with the data as a result. The experience did however prepare me for considering how to develop a methodology when it came to the data analysis for the student diaries which I was by now planning as a source of data for the STROLL project as a foundation for my own EdD research. Later that year and following the interest generated from the use of student constructed video diaries I embarked on leading the major ‘learners’ journeys’ project for BLU and part-funded by JISC, which would provide the foundation stage of the data for my doctoral studies (Jefferies, et al. 2009) as described in Chapter One. While further description of the research methods is given below a brief summary now explains the relevance to this section.

At the University of Hertfordshire I invited a cross-section of undergraduate students (n=54) to reflect on their experiences of using technology in their studies over 18 months through the use of personal video and audio diaries. I present the extensive findings from the foundational ‘learners’ journeys’ work as they relate to my doctoral work in Chapter Five.

Later on in my research, as this project came to an end I identified additional areas to investigate, which built on the video diary material I had just been gathering and which would provide the pedagogical aspect to the student experience materials I had gathered and show how my three themes linked together. I explain the background to this below and then discuss the outcomes from the second stage of the research in detail in Chapter Six.

The 'learners' journeys' research material provided a substantial foundation set of rich and informative data. As I further developed my conceptual framework to incorporate a greater focus on pedagogy, around my three themes of the student, their environment and their use of technology, it became clear that further data gathering in the form of semi-structured interviews with a subset of the original diarists would be required to test out the framework. I discuss in section 4.2 how I revised and extended the conceptual framework first introduced on a personal level in Chapter Two, after I had analysed the early data from the participants' diaries.

The decisions which I took about the philosophy, methodology and approach for the 'learners' journeys' research area were made from a viewpoint which expected to pursue a broadly qualitative approach but which would also provide some quantitative data. This meant that there was the prospect of exploring the challenges of data collection and analysis resulting from choosing a 'mixed-methodology', which included both quantitative and qualitative data gathering and analysis. The quantitative data from the student participants is further explained in Chapter Five and samples are recorded in Appendix 3[13].

[13] Appendix 1 includes the questions used in the diaries. Appendix 2 includes information on how the data was gathered.

### 4.1.3 Identify approach

I have already covered some of the aspects of this third step in the framework in Section 4.1.2. This is because in exploring and refining the process of deciding and justifying the research approach an iterative process needs to be adopted in order to carefully clarify the choices made at each stage.

From the basis of first adopting an interpretivist/constructivist paradigm with a *bricoleur's* approach to researching the student experience, I have chosen to use a case study approach to provide the context within which the data is gathered: *'Case study research involves the study of an issue explored through one or more cases within a bounded system'* (Cresswell, 2003:52). Case study as a research approach has been advocated by Bassey (1999) as the *'prime' strategy for the development of educational theory, where the focus is on real life*'. As a methodological approach it is used extensively in social science and educational research fields, (Robson, 1993; Stake, 2000 and 2006) and the use of a case study can embrace both quantitative and qualitative methods of data collection (Stake, 2000). Yin has defined case studies as a research strategy which is, *'investigating a contemporary phenomenon in its real-life context'* (Yin, 2003:13) and according to Denscombe in a case study, '*the spotlight is focused on individual instances rather than a wide spectrum.' (*Denscombe, 2007:37).

Case studies involve the in-depth study of a particular case or cases but they are not defined according to the data-gathering and analysis methods to be chosen. The opportunities to seek either quantitative or qualitative data gathering are taken subsequent to the decision made on the approach, but as I have already discussed in Step 2 my own area of interest had already been decided. Based on my prior experience there was always going to be a strong

interest in adopting an approach which would allow for gathering and analysing a quantity of qualitative data.

I was further drawn to the case study approach because many of the requirements of this research are clearly satisfied by the case study definition. The 'freedom' to adopt one or more methods of data collection either quantitative or qualitative was clearly attractive as I mentioned above. A case study approach requires a boundary (Denscombe, 2007) and the outer boundary for this research is the University of Hertfordshire's own unique learning environment; this is a virtual rather than a physical boundary, because the use of StudyNet is not bound to a physical location. There are in addition a series of inner boundaries for the study. The focus of the study is on students registered for an undergraduate campus-based programme taught at the University of Hertfordshire. Furthermore it comprised that set of students who had enrolled on an undergraduate programme of study at the university in 2006 or in 2007. The importance of the year of registration is that when I invited students to participate in the reflective diaries I wanted to ensure they would be spending at least two more years studying at the university so that their 'learning journey' would not be finishing just as the research was getting underway.

While students enrolled on a distance learning course also had easy access to StudyNet, it was felt important that the 'local' students were easy to contact and could participate most easily in the intended data gathering through video diaries. Within the substantial set of potential participants that is first and second year undergraduates registered either at the University of Hertfordshire or one of its associate colleges in the county, students were invited to take part in the diary project and a subset of 54 students from across the variety of Programmes available on the campus-based courses was chosen. The choice of students

from those volunteering to join the original research will be discussed below. From within this group of undergraduate students who took part in the foundational stages of the reflective diaries, a further subset were identified to be invited to reflect further on the core areas of this study and to be interviewed for the later stages of the research. These would provide a set of individual 'vignettes' where students discussed in more detail their approaches to learning and used the meta-framework introduced in Chapter One and discussed in more detail at the end of Chapter Four.

In coming to a final decision about the use of case study this 'bricoleur' had initially felt drawn to taking a phenomenological approach for the underlying design of the research and the data collection, because: *'A phenomenological study describes the meaning for several individuals of their lived experiences of a concept or a phenomenon'* (Cresswell, 2007:57). In this situation the shared phenomenon would be the students' lived experiences of 'using technology to support learning at the University of Hertfordshire such as StudyNet' and the two broad questions for a phenomenological approach according to the proposals by Moustakas, (1994) would have been; 'What have you experienced in terms of the phenomenon i.e. 'technology use at University of Hertfordshire?' and: 'What context/situation has influenced or affected your experiences of the phenomenon i.e. 'technology' in your studies at University of Hertfordshire?' Further research uncovered the problem for my planned study of following a phenomenological approach where the importance would lie in defining the commonality in the research, also described as the *'essence'* of the phenomenon or '*the essential, invariant structure'* (Cresswell, 2007:62). The aim of my research is to investigate not just the uniting features of technology use to support learning but also to consider, explore and record the variety of different experiences of the group of students engaging with technology for learning. Furthermore I am not a part

of the group and thus I am not 'living the experience' of the students. So the decision to adopt a case study approach allowed me to be free from the constraints which a phenomenological approach required.

### 4.1.4 Literature Review

Mackenzie and Knipe (2006) rightly identify that knowledge of the relevant literature is an essential element in any piece of research. However, in this context I have chosen not to include a review of the literature as a separate step because the literature permeates the whole study and cannot just be approached at a single stage of the research process. This is perhaps another instance where their useful framework presents an unhelpfully linear approach as I think that a consideration of the literature needs to develop iteratively throughout the whole research journey. To continue the metaphor started earlier, the literature review is akin to having a map or a guidebook alongside the researcher, or rather to contribute to the process of both drawing the map itself and writing the guidebook through the research process. The usefulness and relevance of certain areas of the literature is not just at a single point but they need to be available throughout so that the body of literature can be returned to and reconsidered frequently. This is particularly true in regard to the literature on research in blended learning which is highly dynamic and where much of the relevant literature has been coming to press since my studies started in 2006.

The literature on research methodologies has been the subject of many study days during my EdD studies since 2006 and with the rest of my cohort has been collectively rooted through, dug over, considered, and rejected or accepted. My own exploration has been included above in sections 4.1.1 to 4.1.3.

Readings in the relatively new arena of 'blended learning' have been foundational to my study and some of my early research questions were developed from reading and talking to two key authors; Rhona Sharpe in her review of 'Blended Learning in HE' for JISC (2006) and Helen Beetham whose original article in ALT-J (Beetham, 2005) with its series of questions about research into the use of educational technology and whether/how it could enhance learning, had sparked off my interest in researching the student experience of blended learning.

The literature which draws on a mapping of current educational theories with use of technology, showing how they might support e-learning and thus provide an e-pedagogical approach has provided a backbone to the development of my research design. The key author in this area has been Terry Mayes who with Sara de Freitas and other colleagues, has researched and produced many of the JISC reports on developing e-pedagogical frameworks. I am grateful to Prof Mayes for his willingness to discuss his ideas on pedagogy and for his personal encouragement.

While Mackenzie and Knipe rightly assert the importance of the literature for any research study, the fact that there is no separate literature review in this thesis is relevant. For this study the literature is bound through the overall thesis and it is therefore included at whichever point it is thought relevant.

**4.1.5 Determine data types (qualitative/quantitative)**

The decision about data types has largely been addressed through the choice of the research approach and the research questions themselves described under 4.1.3 and in 1.5. The case study approach I identified will draw on mainly qualitative types of data because:

*'Qualitative data covers a range of material from the descriptions of social life provided by participant observation and unstructured interviews to information from written sources, such as diaries, autobiographies and novels,' (Bogdan and Taylor, 1975).*

The original data collected for the 'learners' journeys' foundational stage of the study is multiple sets of student compiled video and audio reflective diaries. One of the benefits I perceived for using video and audio diaries was the opportunity it offers to students to be more open and expressive, and portray opinions and ideas that is, their own experiences.

The data comprises the digital video and audio recordings and the transcriptions from these. The data from the later interviews, which I have described as 'mini-case studies' and which are discussed in Chapter Six, is in the form of original digital recordings and their resulting transcriptions. For all of these recordings transcripts were prepared to provide a full record of the monologues and dialogues and for an opportunity to read and reread the student comments. In Steps 9 and 10 below I give more detail about the approaches to the data collection and data analysis that were developed through my study and my use of NVivo™ to support a thematic review and a revisualisation of the data.

The diary and interview data could have been analysed by using a quantitative approach as in for example a discourse analysis which might present a set of word counts. My interest is in researching the 'how and why' of the student experience and thus the variety and style of words and comments made by the students are important for this research. Later on through the mini-case studies as the students reflect on their preferences for how they use technology to support their learning, the words themselves are of greater relevance than for example the numbers of words used. I have however used some quantitative analysis to compare:

- the technologies used for different diary stages

- the various student backgrounds including: gender, age, ethnicity, and Programmes of study across the diary participants

Appendix 3 includes graphs of these quantitative findings.

The restrictive linearity of the framework separates out the sections 5 and 6 which should in fact be interlinked so the discussion proceeds straight on to Step 6 below.

**4.1.6 Data collection instruments**

The primary method for data collection in the first stage of the research was through the compilation of personal reflexive diaries by a set of undergraduate students at the University. Diaries have been used for centuries as a means of reflection, and there are notable historical examples in the English speaking world such as Samuel Pepys. More recently studies on the effect of the Second World War on citizens of London were compiled using participants' daily diaries (for example, Harrisson, 1976). Diaries are normally designed for private consumption but from a research point of view they have been used more recently as a means of involving the diarist in sharing their viewpoint with the investigator and as a basis for self study. Wheeler and Reis, commenting on the use of diaries by participants in research refer to; *'…the self recording of everyday life events. Our use of the term 'self-recording of everyday life events' refers to the ongoing recording of any kind of personal experience,* (Wheeler and Reis, 1991:339).

Bolger *et al* reported on the recording of diaries and commented on the uses of electronic means to capture them, stating that:

> *'In diary studies, people provide frequent reports on the events and experiences of their daily lives. These reports capture the particulars of experience in a way that is not possible using traditional designs… Major recent developments include the use of*

*electronic forms of data collection and multilevel models in data analysis.' (Bolger et al, 2003:579)*

Bolger's work broadly supports the use of diaries as a method in research through the use of software and digital tools which can allow for greater quantities of digital material to be analysed. Education studies have made use of diaries for many years and most recently the use of online web logs as reflective diaries (known as blogs) have become popular with academics and students to encourage students to reflect on their studies.

The kind of diary planned for the first stage of this research was a series of self-recorded video or audio diaries, which would result in a large number of digital recordings. The presence of the material in digital form and the opportunities afforded by the use of software for managing the quantities of rich narrative data were important. The successful data management for the diary recordings would have been very challenging if everything had been both produced and then analysed manually.

However, in the interests of making the study accessible to all, so that students who wanted to participate but either were unable to use the technology or did not want to, would not be discriminated against, I offered students the opportunity of keeping a written diary. Ongoing research at the University of Edinburgh has considered diary-keeping amongst new students and offered participants the choice of a paper format as an alternative to using technology for recording it (Hardy et al., 2008). None of the Hertfordshire students chose to take up the paper option, preferring to use one of the technologies offered which were webcam, camcorder or digital voice recorder.

Video Diaries are defined in the online New Media Dictionary ( 2001) as:

*'Video work in which events are related in a coherent manner. Inspired by written diaries, the video diary can be a personal diary, a travel diary or a diary that tells about a specific event in the author's life'.*

For educational research, the use of video diaries was previously noted by Noyes, (2004:193) as: *'an innovative method for qualitative research in education'*. Noyes' method in his study with primary school children was to use observations and semi-structured interviews to understand how they felt about the transition from primary school to secondary school and decided to use video diaries as a method which would allow the children to talk 'freely'. Throughout the paper, Noyes' comments on how written data cannot account for what the children communicate in front of the camera, and when giving a quote from one of the pupils, he states: *'this [comment] is incommunicable on paper and demonstrates… a strong case for employing video methods…'* (ibid: 199).

While this means of gathering qualitative data to record students' experiences of their learning experiences had previously been less common in education, if the lessons suggested by Noyes hold true then they could offer a method that would be more valid than self-reporting on paper of attitudes and activities.

Digital diary technology had been employed by Conole in her 'Learner experiences of e-learning project' under Phase 1 of the JISC Learner Experiences of E-Learning project (Conole et al., 2006). Conole, reporting on her use of audio diaries noted that: *'Diaries can provide rich data about the day-to-day events and contain a realistic account of the activities undertaken by the learners'* (ibid, 2006).

The use of e-diaries and video diaries has been reported for academic purposes previously in the last decade largely for their use in medical trials and as a means for patients to record their regular use of for example asthma drugs and their daily peak flow readings and any

reactions they may have had (Antoniu, 2003). At the same time the use of video diaries in popular culture has lent to the projects an easy acceptability with the students which offered them a 'me-too opportunity', as audiences in their millions have tuned into so-called 'reality' TV programmes such as 'Big Brother' which is aired in almost 70 different countries[14]. Another social use of personal videos and video diaries has been through broadcasting on YouTube, an Internet site where people can upload and share videos. First registered and set up only in 2005, YouTube now has in excess of 2 billion clips viewed each day, and 24 hours of video is uploaded globally every minute[15].

With such high figures of viewing and uploading videos on the Internet - within which of course University of Hertfordshire students were already included - the prior familiarity with the format had been one of the drivers behind previous work for the 'Seven Days in the Life of A Student' project, mentioned in Section 4.1.2.

In determining the use of diaries instead of interviews at the first stage of the research I considered Noyes' work where he contrasts the possible inequality of the position of the interviewer and the participant as a reason for encouraging personal use of the diary form. While there may be less of an age and experience barrier between the researcher and university students than his example of using primary to secondary transfer school children and an adult, the presence and potential influence of an interviewer in a situation needs to be considered. There is also the formality of organising an interview and the time and space constraints of the participant needing to be available in a particular time and place for the interview to take place. The experience of both the original video diaries at the University of Hertfordshire, (Jefferies et al., 2007) and these student diaries first recorded in May 2007

[14] Source Wikipedia (2007)
[15] Source Youtube (2010)

showed that students would apparently record whenever and wherever they felt comfortable; on the bus, in their homes, on their way to classes, preparing food and so on. This created an atmosphere of immediacy and intimacy between the subject and the reviewer of the recording. I suggest that it is the very immediacy of these students' reflections on their learning experiences which has provided both the earlier and current research with such a rich source of data and one which could not be replicated in the interview room.

In order to ensure thematic commonality to each iteration of the diary reflections a set of structured questions was provided for the students. The format for asking the questions is discussed in section 4.1.9 and the questions themselves and how they relate to the student experience of blended learning are discussed in Chapter Five.

The choice of a diary method and specifically video diaries has been examined from the point of view of general social sciences research and from more recent work on using technology to support reflection both in education and in some medical research use. The possibility of undue influence from an older researcher who is using an interview methodology and the inconvenience for the participant of conforming to another's timetable in terms of finding a mutually convenient time and possibly a more formal space have suggested that interviews away from the student participant's home territory may be less satisfactory as a single research method, whereas video diaries controlled by the participant in terms of their choice of time, technology and response for recording have all been referred to as offering the participant an element of control over their choice of when, where and how they recorded their diaries. Most of the students recorded their final

reflection for each day very late at night and this would have been impossible to arrange in a more formal time and place.

### 4.1.7 Identify where, when and who data will come from

I have outlined the demographics of the students I wanted to recruit for the first stage of the study; they were undergraduates on campus-based programmes in their first or second year since registration so that they could participate with the diary reflections for at least 12 months and preferably 18 months before they graduated. The diaries were planned to take a week at a time for students to complete, at approximately 6 monthly intervals. This allowed an 18 month time-frame between May 2007 and October 2008 in which students could reflect on up to four occasions. In practice this ensured that the students' reflections would take place over at least two academic years, thus providing the longitudinal view of their experience of IT for learning that I was seeking. The gap between each of the reflective diary sessions was used to review the transcripts of the earlier material and then prepare for the next set of diaries. I was seconded virtually full time to the Blended Learning Unit at Hertfordshire from March 2007 to February 2009, which allowed me to oversee the research into the student diaries. In the meantime the students participating in the diary reflections were continuing with their studies at the university and their personal experiences were developing and maturing.

Students from across the university were invited to participate in the reflective diaries via tutors based in each faculty as well as from an open invitation broadcast across the University's news on StudyNet. I was concerned to have as broad a set of participants as possible and did not want to have participation concentrated in a handful of programmes. This ties in with Denscombe's discussion on the use of types of cases or as he puts it *'the*

*way the case will be used'* (Denscombe 2003: 40ff); he categorises them as typical instances, extreme instances; test site for theories, or least likely instance. My intention was to seek out where possible a range of students from the university who might be described as *typical instances*. I did not set out with a specific theory to be tested, but was instead seeking to build a theory, after Layder (1993) who uses the distinction of '*theory testing'* as well as of *'theory building'*, as a justification for case study research. The building of my *theory* at this stage was to gather a broad understanding of what kind of experiences the students recorded and their use of some or no technology to enhance their learning. Accordingly I sought as wide a representation of student views as feasible. It was clear early on that it would have been easy to recruit willing student volunteers from just a couple of faculties including those in my own School of Computer Science who already had a technical bias to their studies, so care was taken to ensure that the diarists represented a sample of students from across the undergraduate experience at the University of Hertfordshire. In the end a broadly representative cross-section of the University of Hertfordshire student population in terms of age, gender, programme and ethnicity was chosen. This is summarised below and Appendix 3 provides a summary of the participants in terms of their programmes, the gender and ethnic mix. There was in my decision-making the important proviso that the students should be willing to participate as volunteers as we had noted in the prior 'Seven Days' project.

If students are both interested in the project content and willing to volunteer[16] to record their diaries then it was I believed perfectly valid to let them participate, since an unwilling

[16] Much of the literature on volunteering is from medical or community based projects, focussing on either the post-60 generation, or those with specific medical reasons (e.g. Strauss et al, 2001 and Perry, 1983). Altruism as a motivator is a common theme within those studies and was one of the motivators expressed by the students. Another common motivator in these diaries was the one of 'general interest' that: 'it seemed an interesting project to get involved in' (Student 17) .

person drawn in to reluctantly take part will not necessarily provide thoughtful and trustworthy data. In discussion with the students invited to interview in the second stage of the study for the mini-case studies (see the end of this section and section 6.3) a number commented on their interest in personal reflection and the consequent helpfulness and timeliness of the project in providing an opportunity for them to take time to refine their ideas.

Care must of course be taken within this or a similar study as to how the results are presented so that unwarranted generalisations from an inappropriate group size are not made and I do not claim that this study is of sufficient size for a statistical comparison to be made that might be generalised across the whole university population. This is after all an interpretive study.

As a result of the planning of the data collection methods, the total number of students enrolled to record video or audio diaries was 54 (34 female, 20 male), from a broad age range of between 18 and 51 years at the start of the project. They were studying on undergraduate campus-based programmes based at one of the University's three main campuses at Hatfield or St Albans or on Foundation Degree courses at Hertford Regional College (HRC), an Associate College of the university. Students were drawn from a total of 18 different programmes of study.

In terms of recording the students' ethnic diversity, this was offered as an optional question on the participant questionnaire; from those who answered the question it can be noted that students from at least 8 different ethnic groups participated in the project. The majority of students came almost equally from White (British) or Black/ Black British (African) backgrounds. Three students of Asian origin volunteered for the project.

23 students had been initially based in FE, following HE programmes that progressed to University of Hertfordshire (UH) degree programmes. 31 students were enrolled on programmes based at the University of Hertfordshire and would be studying as a minimum from May 2007 to June 2008. 10 students graduated in July 2008 and completed their final diaries post graduation when they had started employment or further study for example a PGCE. The tables in Appendix 3 indicate the number of students who participated at each iteration of the diaries. Three students declared a disability, two were dyslexic and one was wheelchair based and additionally had limited motor control in her hands due to cerebral palsy.

Interested students were invited to attend a presentation about the project prior to them signing the ethics form for their first set of diaries. While most of the 54 students participated in recording their diaries enthusiastically, some students were inevitably both more engaged in the process and more articulate than others and they provided more insightful reflection in their diaries. The recordings of a small minority of students were hastily compiled or did not answer the daily questions in sufficient detail.

Towards the end of the foundational stage, I wanted to recruit a subset of participants to take part in the next stage of my doctoral research. This was designed as a set of more detailed interviews which would provide data for short mini-case studies of student experiences of blended learning. I explain in detail in 6.1.1 my process and criteria for inviting diary participants to come for interview. Eight students agreed to attend a semi-structured interview and these were held at intervals from May 2009 onwards to accommodate their exams, graduations and placements. The full details are discussed in Chapter Six where the material for the second part of the study and its content and

background is explored further. The interviews used Beetham's Interview-Plus methodology which had been previously piloted by Creanor et al. (2006). This method is itself a development from Bloom's stimulated recall methodology (Bloom,1953) using details which students had mentioned in their diaries as the artefacts. I used the interviews in stage two to pilot my developing meta-framework which focussed on how students described their experience of the pedagogy and technology at the University.

### 4.1.8 Ethics approval

Ethics approval is vital for any research which involves human subjects. Ethics agreement for the use of video and audio diaries for the 'Seven days' project had earlier been granted and so the use of reflective diaries for the 'learners' journeys' research was covering ground already carefully thought through. The use of video and audio means of data collection by university students was largely unreported prior to 2007 and so this research was discussed fully with the University Ethics Committee at a very early stage. A carefully worded document was drawn up in discussion with the Ethics Committee, which all students signed prior to taking part in the diaries and the interviews to ensure their informed consent. A copy of this ethics agreement is included in Appendix 4 and has been used to advise colleagues at other universities who are also using digital diary research methodologies.

When the students brought back their digital recordings, these were transferred from data stick, camcorder, or audio recorder onto a password protected computer with a copy held on a separate computer also in a password protected area. All of the paper transcripts were kept separately in a locked cabinet in an office which was locked when unoccupied. Once a copy had been made of the original recording then the camcorders and digital audio recorders were wiped to ensure no-one else could access the original recordings.

An Access™ database was set up, also on the password protected computer and with a separate copy, so that the participants' details including their contact details could be recorded and held securely. When information is disseminated from the research, students are only identified by a number, their gender and their area of study. The mini-case studies which provide more detailed information about eight students have been presented anonymously using a pseudonym to protect the students' identities.

### 4.1.9 Steps 9 and 10 Data Collection and Data Analysis

These two steps have been combined here because the decisions around data collection and analysis are so intertwined. I use this section to draw together my research design journey and to prepare for the review of the data from the foundation stage of my research, the diary material in Chapter Five. I return to my original paradigm discussion from section 4.1.1 to set out why the interpretivist view is appropriate as I discuss how I set out to analyse the rich sets of data provided from the student diaries.

In this first part of the section I set out the practical considerations from the organising of the data collection and analysis. In the diary stage of the research the students could opt for using a video camera, a webcam or a digital voice recorder, which were all provided for them to borrow. Some students chose to use their own integral webcams on their own laptops and a few chose to record using their own mobile phones. The pattern was that at each stage of data collection the students would collect a set of directed research questions and their preferred technology (video camera, webcam or similar if they need to borrow one) from the office and then go away to record their reflections. My experience from the 'Seven Days' project, see section 3.2, and earlier attempts in BLU at recording data on the student experiences, had identified that it was much more practical to analyse the data if all

of the participants had been answering a focussed set of questions rather than being asked to simply relate what they had done that day. It was also much easier for the students to focus on the question being asked as otherwise they either were inclined to be very brief or they would ramble on. Thus for each of the four sets of diaries I devised a series of five questions, one for each day of the week when they should be recording and some extra ones for them to reflect more generally about[17]. The sets of questions are included in Appendix 1 and they are discussed more fully with the answers given in the next chapter.

Some of the students spent time away from the university on placement after their first diary, in which case they would send and receive their questions and recordings by email (and very occasionally their blogs, when they had a problem with recording). The other students would return to the office a week or so later with their recordings with the borrowed technology and received a shopping voucher to acknowledge the time they had given up for supporting the research. From an ethical standpoint it was felt that the vouchers were not being used as any form of payment for the diaries and so did not constitute a means which would bias the students just to say positive comments. In practice the students did not give the appearance of feeling constrained to only record positive comments. The questions guided them to be objective about their time and technology use day by day. The 'surprise' daily question asked them specifically about an aspect of their engagement with technology, and the videos show them to consider this and then to give a considered answer. Some students were more enthusiastic than others regarding the use of technologies that they particularly liked. Others were too brief (from the researcher's point

[17] In the final diaries in May and October 2008 I reduced the days for reflection to four instead of five as the aim was to review how much change was taking place rather than invite brand new reflections on the students' learning and use of technology

of view) and offered few extra details on their daily lives. The majority of students however completed their recordings with thoughtful and insightful comments.

As I stated in 4.1.1 I adopted an interpretivist stance to the data collection and analysis by seeking to interpret the student diaries and experiences with regard to their narratives of their use of technology in learning (Bassey, 1999). The research accords with the view of Pope and Mays, when they suggest that: *'The goal of qualitative research is the development of concepts which help to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to the meanings, experiences, and views of all the participants'* (Pope and Mays, 1995:43).

I was conscious that the students were being asked to construct in their diaries their own personal narratives and sharing their own experiences of using technology. In order to find an appropriate analytical approach, it seemed right to adopt an interpretivist view here because I wanted to understand and interpret the students' experiences. I did not start off with a hypothesis to prove, as I stated in section 4.1.7 regarding my '*theory building',* but to gather the different views of how technology has been used by the students to support their learning.

In anticipation of a large quantity of qualitative data being gathered from the student diaries, I determined to develop a clear strategy for ensuring that the diary data was carefully transcribed, checked and analysed. This is given in Table 3 below which shows my data analysis 'design approach'. I have separated out here the method used for the diary data for my doctoral studies from the rest of the data which formed the input for my learners' journeys project STROLL. My report for the STROLL project (Jefferies et al., 2009) shows additional stages and outputs for the work carried out for that project and other

stages included in the data analysis which were specific to that work and are not reported for my doctoral work.

The stages of the process with the rationale for each and the expected outcomes are given in Table 3 plus my expected outcomes from each stage. The full methodology up to stage five was completed a year into the data gathering when I was able to use NVivo™ software for supporting the final stage of the data analysis. To assist the analysis post–transcription, the data was colour coded according to the main project themes. NVivo™ software was later used as a means of checking the original large set of data from the diary transcripts. It provided an effective means through the tree structure which the software creates for the different nodes, for comparing the original interpretations of the data between different passes through. I could compare earlier analyses via the tree structures automatically developed by the software thus removing a need for using template analysis. Using the software allowed for faster comparison of data in the final diaries. On reflection I found the NVivo™ package to be very useful and a time-saving measure for the later checking of the data and ensuring its reliability. However, the value of reading, colour-coding and becoming immersed in the diary transcripts first remained important to me and I would not remove that stage of the process in a similar project in the future.

In total the full set of the students' diaries resulted in over 790 pages of transcripts to analyse. As this data was also part of the input for the STROLL project I had support from other members of my team in organising and carrying out the work on the transcripts and the initial colour coding. As Project Director for the STROLL project at the university I had the overall responsibility for deciding what data was analysed and how, and for checking the transcription data and colour-coding and for deciding the design of the nodes for the

NVivo™ coding. I invited another colleague, unconnected with the diary work, to run a check on the NVivo™ nodes and outputs in November 2008 in order to confirm whether the claims which I was making for the outputs were in their view correct.

**Table 3 Data analysis methodology table**

| Action | Reason | Outcome |
|---|---|---|
| **1. Video/ audio diary compiled by student and then watched** | Check content is relevant and technology has worked and student has given relevant answers | Initial understanding of answers to free-flow questions |
| **2. Transcript compiled in Word™.** | To ensure a checkable transcript which can be used for comparison with others | Set of student transcripts from their diaries over 18 month period |
| **3. Check transcript against original recording and make changes if required** | Ensure all extras and possible vagaries have been accounted for | Set of reliable student transcripts from their diaries over 18 month period |
| **4. Highlight student words in transcript in colour** | 2nd stage review to become familiar with the material in the individual diary and to cluster it into sections according to phrases used | Set of transcripts colour coded according to the question themes |
| **5. Upload transcript into NVivo™ and then check data coded into nodes according to broad research questions** | The use of NVivo™, which is a data coding and analysis software package was introduced in August 2008 to speed up data analysis from the full set of transcripts | The students' comments are now easily searchable and can be viewed and compared electronically as necessary |

To clarify each stage of the data collection and analysis for the student diaries for the foundation stage and the later interview data gathered for stage two of my research I have summarised these below in Table 4 to show the different methods used.

**Table 4 Data available for analysis**

| Type of raw data collected | Dealing with the initial data | Outputs used for analysis and checking |
|---|---|---|
| **Video and audio student diaries** | Transcripts of diaries | Colour coded transcripts<br>NVivo™ summaries for checking<br>(plus original video and audio files) |
| **Mini-case study interviews** | Transcripts of conversation | Colour coded transcripts and original audio files |
| **Student participant details (see section 4.1.8)** | Confidential Access database<br>Excel spreadsheet and statistics | Graphs |

### 4.1.10 Write up findings and conclusions

The four words of this final step in the Mackenzie and Knipe framework (2006) appear simple and straightforward in providing closure for the research journey. They belie the requirement for a careful review of all that has preceded them in the careful composition of the final thesis. As I mentioned at the start of my use of the framework the simplicity is both helpful and deceptive since the necessary iteration for each stage of the process is largely ignored. However it does allow for a systematic and thoughtful consideration of each stage of the research process and ensures that the key decisions to be made are duly taken from a background of careful preparation.

## 4.2 The reliability of the work

In designing an extensive piece of qualitative research it is important to consider not just what will be learnt from the case study but whether this represents a reliable and trustworthy piece of work. Robson (1993:66-70) writes about establishing the trustworthiness of social sciences research in terms of the issues of validity and

generalisability. Firstly I will consider here the validity of the research. Validity is concerned with whether the findings are *'really about what they appear to be about'* (ibid). In this case the study is to explore students' experiences of using technology to support their learning in a blended learning environment.

The foundation stage of this research was conducted over a period of 18 months and the interviews were conducted later with students as they approached graduation. As Masterman et al. said: *'there is always the risk that our questions might not only influence students' interpretation of their past experiences but also shape their later ones, with the consequence that the research might not actually measure what it set out to measure.'(2010:39).*

The diaries were designed to give an insight into how students used technology to support their learning. They provided the opportunity for 'theory building' through a case study rather than to prove a prior thesis. The students were all volunteers and as with the later interviews many undertook the diaries because they expressed a keen interest in the project and an opportunity to reflect on their studies. As such there was no intention to influence either the students' use of technology or their approach to learning. Since the university's ICT strategy has required the use of StudyNet for each module, it is to be expected that all the students would have experienced the use of some technology for learning.

In this context the diary questions explained in Chapter Five are designed to help the students clarify how they see their learning and their IT use. The student control of their diaries is important to note here. The benefits of a research method which allows the participants to be in control of place time and content has been noted above. They could watch and reflect and decide in their own time what they were going to make known to the

researcher. The diaries did identify to many of the students how much time they spent online, a point which was reiterated by seven of the interviewees. There is in the findings no evidence that they changed their practice as a result of their discovery as to how long they spent online, they reported continuing to access the internet as much as before or more.

The interviews took place towards the end of their studies and were designed for offering reflection on how changes in learning with technology had taken place. The students were attending freely and I did not teach any of them. There was no compulsion to attend and no evidence of undue influence from the interviewer in the transcripts.

In terms of the reliability of the work, it has been pointed out by Masterman et al. that:

> *'When learners' self-reported experiences are the object of research, one must take the data at face value, triangulating as much as possible in an attempt to distinguish the individual or extreme case from the typical,' (Masterman, 2010:39).*

The student diaries were collected over a period of eighteen months and there was inevitably some development in their attitudes during this time. The student discussions generally showed a progression in their use of technology through their studies. Likewise the interviews provided a later source of data which could be linked back to the students' earlier diary comments through the use of Interview Plus techniques (Creanor et al., 2007). The students were trusted to share their experiences truthfully and the open nature of the questions meant that they were designed to be used discursively with no implied right or wrong answers. They had no need to tell lies and if they did not want to take part in all of the diary opportunities then there was no compulsion to do so.

In terms of the generalisability of the work, this was a specific case study in one unique location with *'plenty of rich description'* (Robson, 1993:73). There have been plenty of opportunities for triangulating the outcomes of this qualitative research; these include the

original quantitative survey of participants which provided statistical data for analysis and thus inherently allowed comparison to be made with research conducted into other undergraduate student populations as well as our own at Hertfordshire. It also includes the detailed interviews in stage two with participants which reinforced earlier points made about blended learning. However as I have asserted earlier in this chapter, throughout this research the aim is not to provide a full answer to a previously decided thesis but to explore student experiences of blended learning. My aim is to construct a theory and thus to find a range of experiences. To that end I have not sought a specific answer but instead their contribution to the '*forming of questions rather than […] the finding of answers.' (Donmoyer, 1990, 2000: 51-2).*

A directly replicable study is not possible because of the fast changing technology and changing student backgrounds and the different learning environments, but the same questions can still be asked of a different group of students. On the basis of other research carried out both nationally into technology use and locally through the BLU (see below) I suggest they would still provide a similarity of replies in terms of the broad range of experiences of pedagogy, the ubiquity of technology use and the complexity and diversity of student experiences uncovered.

## 4.3 Frameworks for researching the student experience of blended learning

### 4.3.0 Introduction to a conceptual framework

Miles and Huberman described a conceptual framework for the researcher in the following way: *'A conceptual framework explains either graphically or in narrative form the main things to be studied- the key factors, constructs or variables- and the presumed relationships*

*between them,'(1994:18).* In this section I return to the work I first introduced in section 3.0 where I explored how other e-learning researchers have sought to categorise the student e-learning experience through the development of their own frameworks. In section 4.3.1 I review the proposals of these research leaders from the context of my own research into the student experience of blended learning, both through the simple student-focussed Venn diagram (introduced in Chapter One and taken up again in Chapter Six) and in my more complex matrix framework which allows for student reflections on both their use of IT and the teaching approaches they experience in HE. After discussing the contribution of other conceptual frameworks to my research I present in section 4.3.2 my own conceptual framework for blended learning for combining the students' experiences of pedagogy with the practical use of blended learning technologies. The conceptual framework I present here is constructed from the theoretical bases for pedagogy developed in Chapter Three and my exploration of the online technologies used to support a blended learning approach, discussed in Chapter One. The primary purpose for developing the framework is to offer a means of describing and then comparing the students' experiences of pedagogy and technology from the detailed interviews I held with a subset of the original diarists for stage 2. These and their findings are explained in detail in Chapter Six.

### 4.3.1 A geometry of conceptual frameworks for e-learning and blended learning

The researchers I refer to in this section include: Beetham and Sharpe (2010), Garrison and Vaughan (2007), Salmon (2000, 2005) and Moule (2007). I do not claim that this is an exhaustive list of possible e-learning frameworks but I believe that each has something useful to contribute to my discussion and the development of my own blended learning conceptual framework.

The context for Sharpe and Beetham's work has been their research into e-learning in higher education over the past several years from across many institutions in the UK and in their work providing support and consultancy for the JISC E-learning programme. They approach the development of their framework for effective e-learning from the point of view of the learners' experiences (Beetham and Sharpe, 2010:88) and describe it thus:

> *'Over a period of 4-5 years, we have verified and clarified our ideas in order to gain an understanding of the factors that learners themselves perceive to be influential in learning effectively in this technology-rich age.'*

Their model is represented as a pyramid (Beetham and Sharpe, 2010: 90) which describes how learners move from having a functional access to technology to support their learning at the base of the pyramid to the apex where the most effective e-learners have, in their words, gained *'creative appropriation*' and *'make use of the skills and practices they have developed to create their own learning environments*'. Students may locate themselves at different points of the pyramid. The outcomes from their research into learners' experiences of learning with technology (which have also been mirrored in my own outcomes shared below) are that:

> *'The most consistent finding of the 'Learners' experiences of e-learning programme' has been the sheer diversity, in which learners understand their learning with technology, (ibid: 95).'*

Their pyramid framework which I have discussed with them over recent years is a valuable contribution to understanding how institutions can support their learners to learn effectively with technology. Conversations with them about their research and their passion for enhancing the learner experience helped me to crystallise my early ideas on the importance of researching the learner experience and thus to inform my own developing conceptual framework.

Garrison and Vaughan have been leading researchers into blended learning in Canada for many years and their recent book on the subject provides one of the most astute insights into describing what blended learning is (as quoted in Chapter One). They offer a different model of considering blended learning as one which: '*advocates that leadership realize the potential for institutional transformation while providing fundamental practicality for faculty success'* (Truman in Garrison and Vaughan, 2008: back cover). They have developed a Community of Inquiry (CoI) framework for blended learning and present it as intersecting circles in a Venn diagram; the three circles represent social presence, cognitive presence and teaching presence (Garrison and Vaughan, 2008:18). Their CoI framework has been widely cited in the literature and its success is described by the authors as due to it being *'comprehensive, yet parsimonious and an intuitively understandable framework… it builds on the two ideas that are essential to higher education, community and inquiry.' (ibid:9)*

My own use of a Venn diagram with three circles for exploring the student experience (introduced in Chapter One and explored further in Chapter Six) had already been developed prior to the publication of their book but their scholarship provided an opportunity to investigate their use of a similar design to compare it with my own early ideas. While I have focussed on the student's experience within my use of a Venn diagram, Garrison and Vaughan use their model to include the wider HE establishment and to offer guidance at a strategic level. My own research is more compact and seeks to understand the multiple views of the student learners.

Salmon's 5-stage model for e-learning (Salmon, 2000) was developed with the educator firmly in mind, from her own practice in HE. It was one of the first e-learning models to be widely shared across the e-learning community and is widely quoted in the literature. It was

developed from her early use of asynchronous discussions in the 1990s with students at the Open University Business School (Salmon, 2007) and has variously been described as a conceptual framework and an instructional model. Salmon, herself describes it thus (2007:171):

> *'For me, the five-stage model's popularity arises because it works as a framework for use that has enabled individual academics and course teams (often those working without the benefit of instructional designers) wishing to work online productively, to customise, personalise and adapt it to many purposes, contexts, countries and technologies rather than as a constraint.'*

The model presents five stages of developing online learning as a series of steps (Salmon, 2000, 2004) which is suitable for a wide body of practitioners since it is described in an easily accessible format for educators whether experienced e-learning practitioners or beginners. More recently it has been adapted to accommodate virtual learning through Second Life (Salmon, 2007).

Salmon favours a social constructivist approach to e-learning, which encourages online collaboration and communication between teachers and learners; although she agrees that this was not an intentional part of the original design (ibid). It is this adoption of a single approach to learning and instruction which has been the source of some of the criticism of the model from *inter alia* Moule (2007). Moule's work within healthcare education has led her to develop Salmon's step model into a ladder which offers a clearer focus on pedagogical approaches. Moule's model is described by her thus:

> *'In contrast to the five-stage model, the e-learning ladder acknowledges a range of learning approaches, starting at the bottom 'rung' with an isolated approach to learning that might be termed as instructivist and moving through the 'rungs' ending with constructivist, or interactive learning approaches … Through the inclusion of*

*different learning approaches from isolated through to interactive learning, it acknowledges that not all e-learning is constructivist or course based and reflects the range of e-based learning materials available.' (2007:38)*

The ongoing discussions between Salmon and Moule about the relative values of their models have proved fascinating and have allowed me to explore further my own ideas about developing a conceptual framework. An important part of the discussion has been to enable a variety of styles of pedagogy to be available to students. In developing my own framework I have tried to consider the meta-level and offer a range of pedagogical styles, similar to Moule's work but I also wanted a framework which acknowledged a blended learning approach to the student experience rather than an approach which assumed that everything was conducted online. Hence my own framework offers both an acknowledgement of different pedagogic styles and a choice of learning environments. Since it is not on the level of course design and management issues and presents the student experience of their learning, I have called it a meta-framework (Jefferies, 2010).

In summary, Sharpe and Beetham's work presents the view of effective e-learning from the student's perspective; Garrison and Vaughan take a broader view of blended learning and consider the strategic implications for HE as well as providing support for the local practitioner and an understanding of the student perspective. Salmon and Moule in their models offer contrasting views of the underlying pedagogies and the support these offer to designing effective e-learning.

### 4.3.2 A conceptual framework for a blended learning pedagogy

In my descriptions above I explained that I wanted to develop a conceptual framework which would embrace both the pedagogical and the technological aspects of the students' blended learning experiences when I came to the detailed interviews of stage two of my

research. I had a third criterion which was that the framework should be simple enough for me to use with students so that I could explore their own experiences of using technology to enhance their learning without embarking on a detailed explanation of terms.

I first designed two continua, the first in Figure 4.1 shows a continuum on the use of technology in the student experience from a face-to-face environment where the learning takes place without technology to a fully online learning environment (as envisaged by Salmon above) where all the student learning occurs online and virtually, either synchronously or asynchronously. The arrow importantly indicates that student use of technology for learning may occur at any point on the continuum according to the course design as will be seen in Chapters Six and Seven.

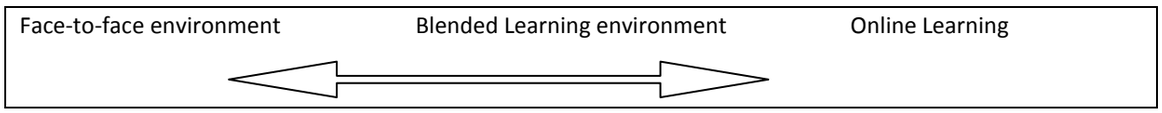



Figure 4.1 **A continuum for including technology in student learning**

The second continuum allows different pedagogical approaches to be offered to the learner and uses the work discussed in Chapter Three on identifying the use of pedagogy with technology in blended learning. Once again the arrow is bi-directional. This time it is to ensure that no single direction for pedagogy is implied and that pedagogy can be designed to take place at different points.

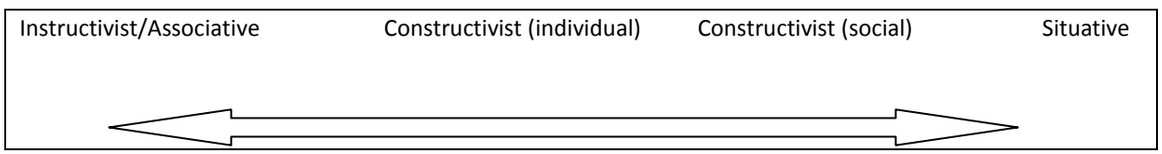



**Figure 4.2 A continuum for models of pedagogy (after Mayes and de Freitas, 2008)**

The continua in Figures 4.1 and 4.2 are both presented above as flat figures, so in order to investigate both aspects of the students' learning experience, that is, the pedagogy and the technology I constructed a matrix framework. Figure 4.3 below shows the combination of the two planes from the pedagogy and the technology views.

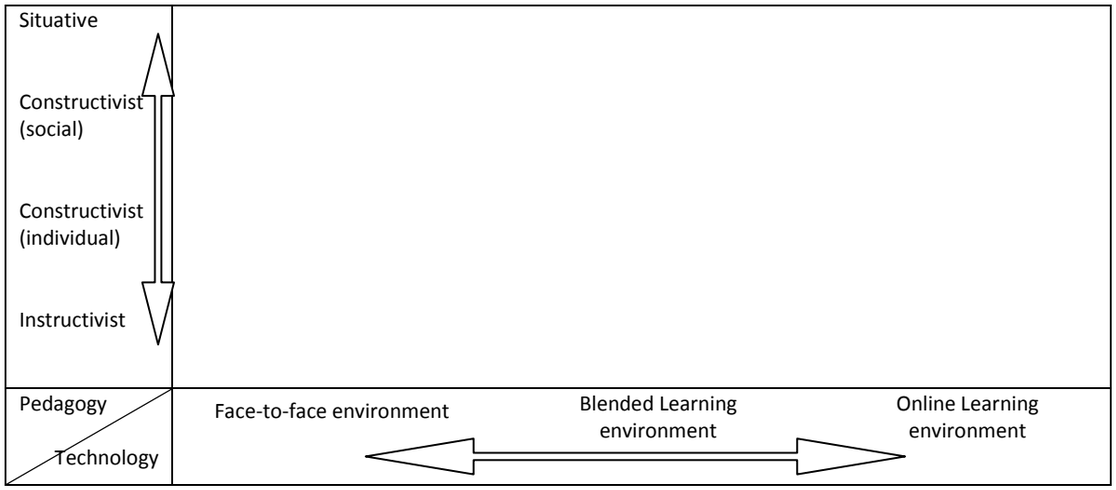



**Figure 4.3 A framework for investigating pedagogic models and the use of online technology**

The aim of designing the framework was to present to the students in their interviews a simple matrix, where they can identify both the amount of technology and different approaches to pedagogy in their studies. The horizontal axis represents the type of learning environment, so they can place each module on their personal framework and the vertical axis offers different pedagogic styles that they encountered in their HE experience. The students were asked to identify both the amount of technology used in their learning and the pedagogic style of their different classes. The outcome from the interviews included a personally constructed blended learning framework for each interviewee, with the transcript from the recording in which they discussed their experiences of using technology in their learning at the University of Hertfordshire.

## 4.4 Summary

This chapter has discussed the paradigm, the methodology choices, the method chosen and the decision-making processes surrounding them, which I have chosen to use in my research into blended learning. The use of Mackenzie and Knipe's research journey framework has provided me with exactly what it suggests, a 'framework' to use for discussing the research process in a logical way that provides a means to ensure all the primary questions necessary for explaining the research approaches which I adopted have been asked. I have intimated above that the Mackenzie and Knipe framework has a deceptive simplicity. This raises some issues for the practitioner-researcher who finds that the research journey does not follow an essentially linear and constant path but the journey turns out to be full of personal iterations, 'cul-de-sacs' and occasional retracing of steps. In practice, therefore, the research journey has not been as linear as they suggest it might be but the use of a framework ensures that the recommended steps are considered in a broadly logical progression and the questions to consider at each stage are laid out clearly for the researcher.

In section 4.3 I considered a variety of recent conceptual frameworks for modelling e-learning and blended learning before describing my own design for a blended learning approach which includes both a consideration of the amount of technology used and the styles of pedagogy encountered by the students. This will provide the structural framework for interviewing individual students on their blended learning experiences in stage two of my research. The importance and uniqueness of my work lies in this combination of the pedagogy and technology experiences of the students through the conceptual framework.

In Chapter Five I discus the diary questions the students were asked in the foundational stage of the research to explore their use of technology in their learning over the 18 months

of the reflective video and audio diaries. Then the broad findings from the diaries are discussed and stage two of the research is introduced.

The contribution of this chapter has been to explain the details of the research methodology followed. In the process I have proposed a new pedagogy/technology framework with which to explore students' engagement with their learning through technology in a blended learning institution.

# Chapter 5: The student experience of blended learning from their reflective diaries

*'I wouldn't say it's [technology] changed as much as I have developed using it...I am becoming more dependent on it I suppose and I'm using it more.' (Student, 2007)*

## 5.0 Introduction

In the previous chapter I described my research design and the approaches I have taken for the two stages of my research; stage one being a set of student reflective diaries and stage two being the later set of detailed interviews held with a subset of the diarists. These both contribute overall to the three themes which I set out in Chapter One: the student, their studies in HE and the use of technology for learning, and serve to answer my research questions.

In this chapter I consider the detailed outcomes from the reflective diaries compiled by the students for the foundational stage of my research and in so doing consider answers to the first two of my research questions (from section 1.4).

- How do students use technology to support their learning at the University of Hertfordshire?
- What is their experience of blended learning as students on a campus-based programme?

The purpose of this stage as part of my *theory building* was to gain a broad understanding of how students at Hertfordshire use digital technologies for their learning and how they blend their learning. I had set out to consider how students use e-learning tools to support their

learning within the context of what the institution provides for them via StudyNet and I described in Chapter One the extent of the university's intranet provision through StudyNet with annual access figures in excess of seven million logins for staff and students. As I undertook the diary research I soon realised that the students' use of learning technologies was not limited to their use of what the university provided but extended widely into their use of what I shall call their personal technologies.

Personal technologies would typically have included in the early years of the 21st century, say up to 2004, the students' ownership of computers, mobile phones and digital music recorders such as mp3 players. Technology available for the ordinary consumer has moved on significantly in the past few years and there are means of communicating and working which exist now which were not previously imagined for mainstream users. Through the course of my doctoral studies since May 2006, the use of social networking has transformed the landscape of personal technologies and mobile telephony has changed the way people communicate and share information. The potential via 3G technology for owning a mobile phone which offers easily accessible and downloadable internet, video and 'apps' and the increased sophistication in the design of mobile communications has further transformed the opportunities for communication with friends and studies to a 24/7 basis, that is all day and every day.

The beginning of my research for the foundational stage coincided with the sudden rise of Facebook social networking sites in the UK. Facebook had been previously used mainly at universities in the US since 2005 but there was a surge of interest in its use particularly with university students in the UK in the first half of 2007[18], in a way that had not been recorded

[18] One useful chart is at: http://www.insidefacebook.com/2008/12/16/facebook-now-growing-by-over-600000-users-a-day-and-new-engagement-stats/

with the other popular teenagers' social websites such as Beebo and MySpace. In the time between the original writing of my registration document and the start of the diary research, Facebook had begun to have a serious impact on the UK HE scene, having been originally designed for private use in the U.S. HE network. Its use therefore informed the questions I would ask students for their diaries. At the start of 2006 there were just over 5.5 million users, this grew to 20 million by the end of 2007 and at the point of writing there are now an estimated 500 million users worldwide[19].This unforeseen growth in the use of social networking has arguably had a profound influence on the use of the internet by those who are enrolled as students.

A majority of the students commented in their early diary reflections from May and October 2007 that checking Facebook was a daily activity for them. In Section 5.2 below I include a selection of comments about their use of social networks and I return to the subject again in the student interviews in Chapter Six. It has been a matter of informal debate in academic circles as to how far students seek to use Facebook for supporting their studies and whether academics should encourage this and be online themselves. Melville's report (2008) noted that many students preferred to keep Facebook for an informal personal networking site separate from their academic study. The student mini-case studies indicate a heavy use of it for personal networking which may also be related to academic studies such as Dave's (section 6.3.3) use for arranging meetings for group work. They also record use by students and their lecturers in discursive subjects such as Philosophy.

While I had originally planned for a broad consideration of how technology can enhance learning it became clear to me that the technology provision should be considered from two

[19] Source Facebook's own statistics (2010)

aspects, those technologies provided by the institution, the University of Hertfordshire and those which are personally owned and provided by the students because of an indistinct boundary between the student use of the technologies.

In Chapter One I noted that not all students belong to the so-called 'iPod generation' or Net generation (Oblinger and Oblinger, 2006) and it has been an important part of my research to ensure that the views of those students who have not grown up with technology were considered alongside those who are 'digitally literate' on entry to the university. In the findings section in 5.3 I return to consider how the mature students are served in a blended learning environment.

## 5.1 Designing the reflective diary questions

The detailed question areas which the students responded to in their reflective diaries for this stage of the research are drawn out of the first main research question - How do students use technology to support their learning? - and shared below:

- How do students use online tools to support their learning?
- How do students use their personal technologies?
- How do students' experiences of using technology change through their learning journey?

These questions were asked in the diaries at six monthly intervals to elicit student reflections. In Figure 5.1, I reproduce a sample from one of the sets of diary questions. There was a similar pattern for each diary day where the students were asked to reflect generally on what they were planning to do in the morning and then what they actually did and the technologies they used. Each day there was a different question sometimes called the

'surprise question', which was more focussed than their daily pattern of reflection. The aim of this was not to test the students on offering the same answer for each diary reflection but to investigate their changing experiences. For example students were asked in October 2007 what their current favourite piece of technology was and then reminded of this in the following diary iteration when they were also asked whether there had been any change. The full sets of questions for the students for each iteration of their diaries are included in Appendix 1.

**October 2007 Day 2** **Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

**Surprise question:**

How has your use of technology to support learning changed in the last year?

**Figure 5.1 Sample Question sheet (Day 2 October 2007) from the students' reflective questions**

As not all students completed diaries for each of the four stages (see Appendix 2 for the summary of diary participation) there was some repetition of the early questions from May 2007 in October 2007 to ensure that students who joined the diary reflections later were able to provide a base point from which to reflect on their use of technology. In total 20 students completed all 4 opportunities for diary reflections with 40 students completing 3 or 4 diaries. The remaining 14 participants completed one or two diaries. Details of the diary participants' backgrounds which were gathered from the initial questionnaire they were

asked to complete are given in graphical format in Appendix 3. The technologies they used for the diaries are also included in Appendix 3.

The longitudinal nature of the diaries and the consequential reflections enabled me to see the changes which were reported by the students in their use of learning technologies over time. This was one of the areas discussed in particular with the stage two interviewees.

## 5.2 The students' experiences of using technology to support their learning

In this section I take each of the main question areas in turn and examine the students' words from their diaries to provide some answers. The students' words are identified via the anonymity numbers from the database. I provide a summary of the findings at the end of each section and then in section 5.3 I provide an overall summary of the outcomes from the foundation stage. The students' words were assembled from the results of the data analysis methodology described in Chapter Four which used both colour coding of the diary transcripts and the NVivo™ analysis software for drawing together the students' comments for each theme.

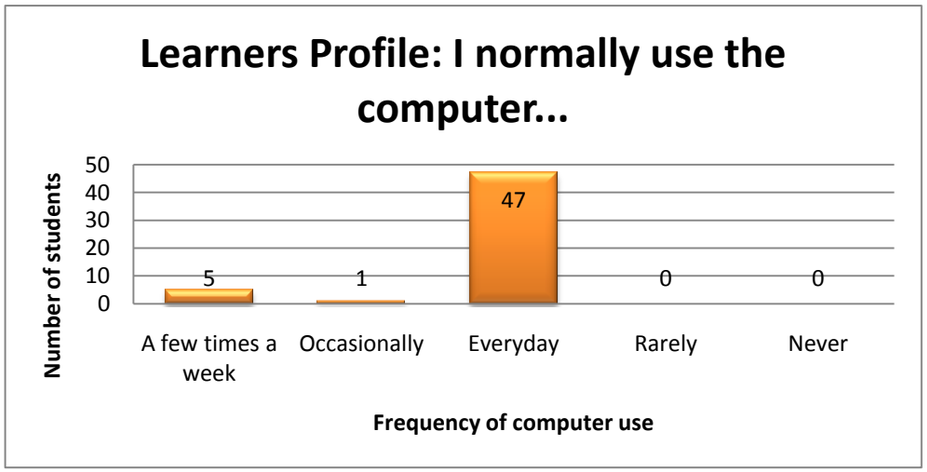
### 5.2.1 How do students use different technologies to support their learning?

The importance of the university's MLE, StudyNet, in the provision of an intranet for supporting the access of online materials through personalised portals by students and staff was explained in Chapter One in the introduction to blended learning. Prior research has pointed to the high regard that most students at the University of Hertfordshire have for StudyNet, (for example Jefferies, 2006). In their diaries students recorded that they made widespread use of e-learning tools to support their learning and in particular they used

StudyNet. They had high expectations of using technology and being online regularly, see Table 5 below, where 89% of those answering the question in the associated questionnaire claimed that they used a computer everyday.

All of these students except one praised the usability, the ease of access to and the ready availability of StudyNet and thus the opportunities for accessing online materials through the University's provision.

**Table 5 Learners' regular use of computers in 2007**




Not only is StudyNet very widely used but it was described by students as being like a 'one-stop shop' where they can access everything related to their studies. Occasions when StudyNet was not available due to system crashes were very rare (a matter of a very few hours over the 18 month diary period) and students became heavily reliant on it always being available for them. In Table 6 a selection of the many students' comments on their use of StudyNet are presented. Some of the students compare their use of StudyNet with other learning opportunities they have experienced either at school or college

**Table 6 Using StudyNet**

| Using StudyNet | ID |
|---|---|
| *The biggest change in learning [from school] was the use of StudyNet, anything you want basically to do your course was on it, it has been so helpful.* | *44* |
| *I feel Study Net is a great inspiration in the learning process. At college if I missed a class I would very rarely get the opportunity to catch up on what I had missed (HRC)* | *19* |
| *I have made more use of the internet in terms of academic websites and journals.* | *41* |
| *Podcast* [accessed through StudyNet*]continues to be a great inspiration to the way I learn, I find it so helpful to listen to again and again* | *9* |
| *I would be working at 3 or 4 in the morning… regardless of where I was I could always get all my work…the ability to access the [university] network is what I've found most useful….It means at home, whatever time of day or night I could grab my files and start working.* | *16* |
| *I want to say how useful Study Net is…great resource, you don't need anything but Study Net to do your work, you can contact your tutors, it is really well organised and it's not overly fancy.* | *18* |
| *I check my university emails and my StudyNet everyday* | 12 |

Many of the students recorded in their later diaries that their use of StudyNet increased further over time and that their mode of use also changed and developed. They cited examples of increased use such as their widespread accessing of online journals and research databases to support their research projects. This resulted in them accessing materials with more carefully thought-out strategies for finding relevant information instead of a former more superficial but still frequent engagement. Table 7 reports below on some of their comments on this more thoughtful strategic use of searching for finding information as they approached graduation. This material builds on the comment quoted in Chapter One from the CIBER group's report on the inherent shallowness of many internet searching strategies adopted by students going up to university, because of the speed of their searches and their failure to adopt a critical approach to information found online (CIBER,

2008). These results indicate that these students displayed an increasing discernment in developing search strategies for the internet which returned material relevant to their studies, when presented with the academic opportunities by the university.

**Table 7 Use of online search tools for supporting learning**

| Use of online search tools for supporting learning | |
|---|---|
| *I now use a lot more research, and a lot more data from research journals and journal writing. I don't use books in my assignment so much anymore, I tend to use evidence-based research* | 58 |
| *Google is the wonderful thing which wasn't around 20 years ago when I was first involved in further education and it just eases the research which you can never imagine if you had never had it before.* | 41 |
| *Wikipedia. And I don't mean it in a bad way and I certainly don't use it to reference any of my essays or assignments or anything like that but it's very good if you are starting out on the subject.* | 15 |
| *I have started off using the odd book and a journal article here and there and progressed. Just to use more books and more journals and to read more, probably towards the latter part of my degree I spent a lot more time in the LRC which is the big change.* | 11 |

Many students reported using StudyNet extensively outside the Monday to Friday 9-6 'working week', with a large majority of them using it as an overall information resource, in addition to joining discussion groups for specific study areas. Some students who had off-campus access in their homes would still report coming into the learning resource centres in the evenings and at weekends to have a quiet place to work online. Access to study materials from locations off-campus for these students, whose programmes were taught on-campus was valued very highly, as Table 8 indicates. This indicates the importance to students of the 24/7 accessibility strategy for StudyNet. Access figures for StudyNet made available to academics indicate that StudyNet is used around the clock and 365 days per year, even when the physical university campus is closed. So for example Christmas Day records report a regular number of users globally when the Hertfordshire site is locked up.

These are both post-graduate and undergraduate students who are home and overseas registered as well as those participating through fully online programmes.

As students mentioned in the quotations in Table 8, they would sometimes use StudyNet for working on joint assignments and for both mundane (finding a lecturer's office) and complex activities. Although the pedagogical issues will be drawn out more fully in Chapter Six the diaries recorded frequent use of collaborative working on assignments so that material was stored and accessed online in a single virtual location by all participants in the group. This was either of their own devising and organising, through an application such as Google docs or through the setting up of virtual groups for individual modules by an academic. Table 9 below reports on the use that students made of different technologies such as the 'Google docs' application to support their collaborative working in groups.

**Table 8 Accessing information online when off-campus**

| Accessing information online when off-campus | ID |
|---|---|
| *Well, I used the internet looking for where the office of my tutor is and I also used StudyNet to check my journals, to find out what I needed to show my lecturer today.* | 13 |
| *e-books on Voyager has been very useful when I haven't been able to get to the library and I can get them online and for my dissertation* | 10 |
| *Have been using Word all day and I've been using J.store journals. I've been using Google - best place ever. I've been using Stanford Encyclopaedia, which is online. I think life would be easier if a lot of the books that we had to read up were available online.* | 7 |
| *I think I probably knew what MSN was in my first year but didn't use it. Not until probably the third year for transferring files back and forth, arranging group meetings and checking up with each other how others' parts was going (sic).* | 45 |

**Table 9 Students working collaboratively online**

| Working collaboratively online | ID |
|---|---|
| *I used Google docs to compile a document with others, as we contributed together online* | *4* |
| *I can keep in contact especially when we are working in groups, with people who are doing the same assignments as me. We can discuss the material for the assignment and even work together, if it is a group kind of thing. We can do it by WebCam, voice conversation, we can just talk together, or type to each other, it's just sharing information because MSN allows you to send files from your computer, so that really facilitates a lot of group assignments.* | *31* |
| *One of the group members was not able to make it today so what we did we were connected by using MSN messenger so we were discussing notes. We were feeding back to the other person.* | *3* |
| *If there was a question I couldn't do and found no useful material on I used Windows Live Messenger (instant messenger program) to discuss that particular question with my friends.*<br>*I used the class discussion feature on StudyNet to ask for help on a few of the questions I could not grasp but someone already had the same problem as me so I just read through the thread they had posted.* | *19* |

Students' use of technologies encompassed both the formal choice of tools such as general use of StudyNet which has already been well-documented above and their own choice of personal technologies for learning. Questions in the diaries asked students to identify which of the technologies provided by the university were their favourite and to give a reason. The choice of the word 'favourite' was deliberate to determine if there was any enthusiasm or emotion for specific technologies. Students answered this in various ways; some interpreted the term to mean 'most essential' or 'most popular' and the videos recorded some animated comments and enthusiastic demonstrations of the technologies they used. While the answers provided the intended emotion about the use of technologies, the use of 'favourite' should have been spelt out more clearly. The transcribed words give an indication of the warmth with which many of the students spoke about this in Table 10. From the answers

provided it is clear that StudyNet and the associated applications such as access to the library system and the journal databases were very popular.

**Table 10 Favourite Uses of technology to support learning – provided by the university**

| Favourite use of technology to support learning - provided by the university | ID |
|---|---|
| *I would say the one technology I couldn't do without is probably StudyNet because that's the only place you can find out everything about your course and all of my modules and what's going on and it's the way that my tutors contact me as well so it's probably the most useful thing that I have for my study.* | 36 |
| *[It's] because of the variety of areas to StudyNet like class discussion, the fact that you can find lecture slides and tutorial material on StudyNet as well* | 8 |
| *StudyNet. It's really, really good because if you missed a lecture you'd find lecture notes on StudyNet or...if you had a really, really burning question that you can't get hold of tutors or any friends you could use the discussion site. That was really, really good and often tutors would sort of pop into the discussion site and see what people were talking about and if people were worried then they would set it right* | 46 |
| *Voyager. Without a shadow of a doubt Voyager [Library system]. That thing is the 'nuts'. Being able to get those journals and articles whatever you want and being able to request journals and articles that the uni doesn't have* | 16 |
| *StudyNet was massive and a great help* | 41 |

As far as their reflections on other technologies which students reported as being their preferences, there was a high preponderance of students mentioning their computer or laptop and the internet as their favourite technology. These are recorded in Tables 11 and 12 below. There was an eclectic use of small digital technologies that they perceived to be valuable and their favourite personal technologies at the time; such as USB data sticks, Dictaphones and mp3 players including iPods which were all used to support learning.

In the initial statistical analysis of the diary participants 74% of the students taking part owned a computer[20], which includes laptops or desktop systems and Apple Macintoshes. All of the students owned a mobile phone. Regrettably I did not emphasise sufficiently that I wanted them to reflect more deeply and give a critical justification for their choice or explain fully how they actually used them for supporting their learning.

**Table 11 Students' favourite technologies for learning October 2007**

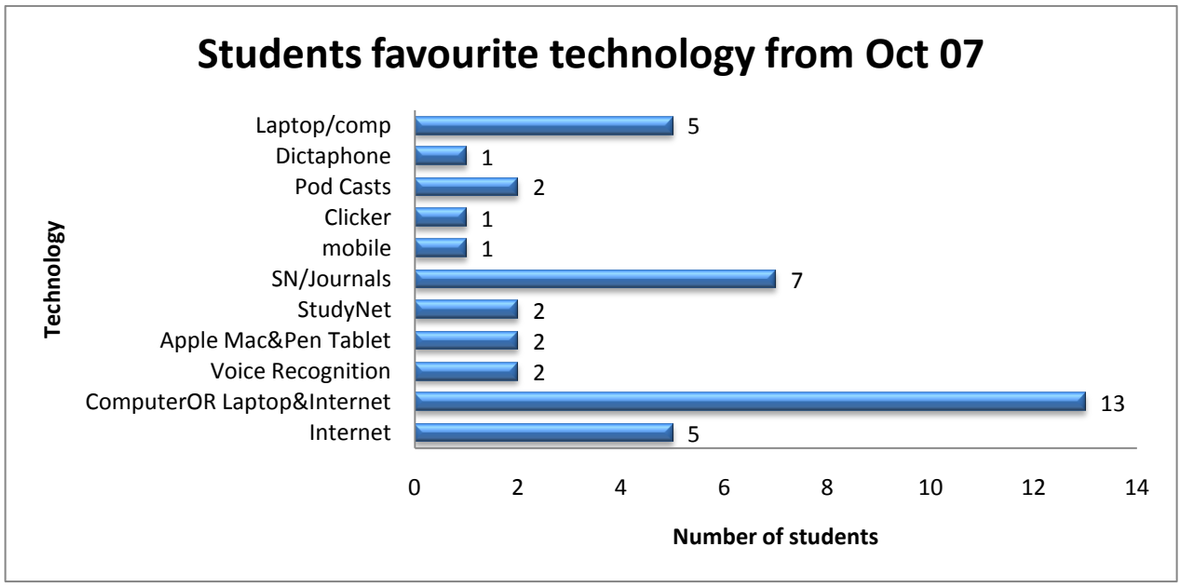
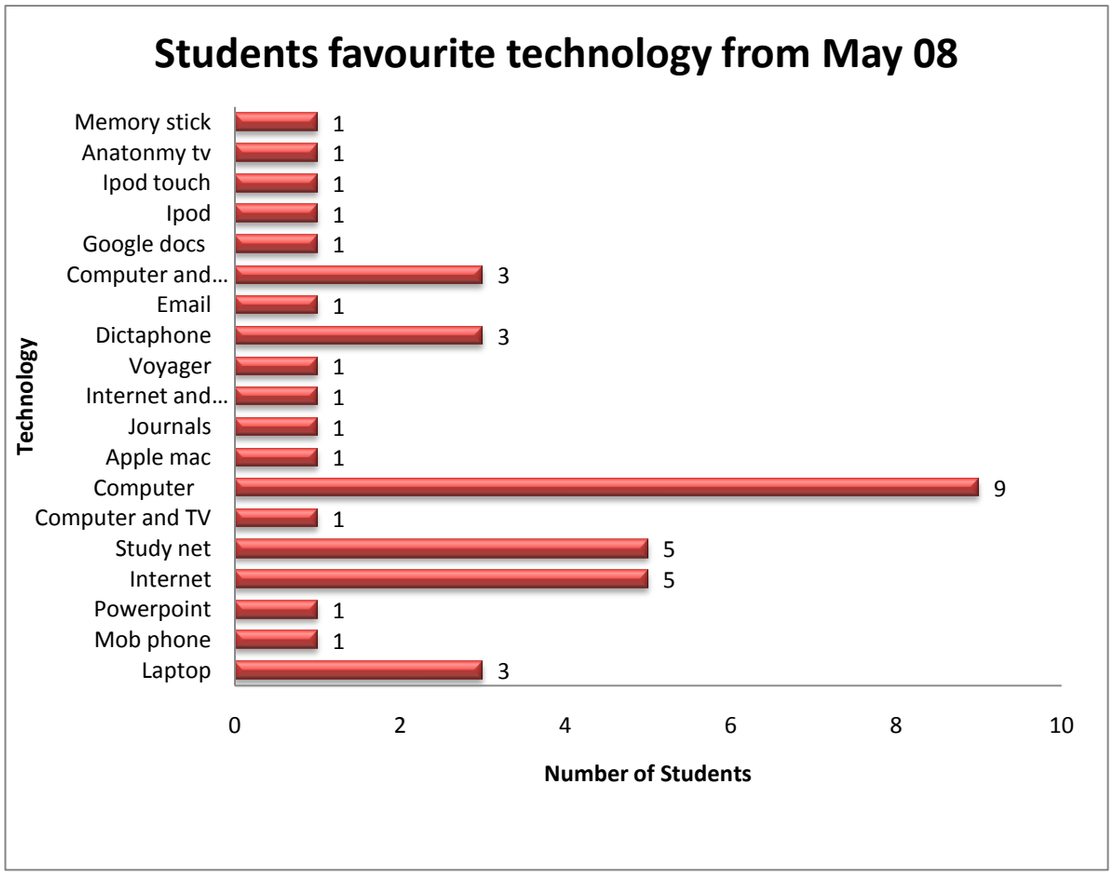



Table 11 sets out the preferences for using technology and the students' uses of a narrower set of technologies than reported in Table 12. These were gathered from the students' own descriptions in their diary entries and have not been further refined into discrete categories. For example the students who owned an Apple Mac did not describe this simply as a computer! Students reported separately on their use of StudyNet and while it was reported as being very well used it was not necessarily their favourite technology. By the time the students were reflecting on their 'favourite' technologies six months later as reported in Table 12 there is a wider variety of digital technologies being used to support their learning.

[20] This figure recorded in 2007 turned out to represent a rather low percentage of computer ownership amongst students, when compared with statistics from other universities e.g Edinburgh, Southampton,Oxford. Since 2008 the University has recorded an increase in computer ownership amongst students registering for a full time degree.

Students from this set of undergraduates at Hertfordshire, with the exception of those on healthcare programmes with frequent placements (n=8), were typically in part-time employment as well as being registered full-time for their studies (71%). In Appendix 3 there are two tables relating to student enrolment and employment; one which identifies how many students were enrolled as full-time (n=50) or part-time students (n=3) and then how many of them were in either full or part time employment[21].

**Table 12 Students' favourite technologies for learning May2008**




Some students have carefully planned out their schedules for balancing work and study. For the minority of students who had demanding part-time work[22] and/or had family

[21] Although 54 students took part, one of them failed to complete most of their questionnaire so most answers relate to 53 students.

[22] 3 were registered as part-time students but it was not uncommon for students to have more than 1 part time job

responsibilities in addition to studying full-time, the following excerpts indicate typical examples of how they fitted their study into a busy work or home lifestyle and the importance of technology for supporting their studies.

> *'I have to work three shifts a week. So I work on Saturday morning and Monday evening and usually a Friday evening. I also have commitments on a Tuesday evening. Fortunately on the course we get all of Wednesday off which is great. It is just a really good chance to knuckle down partially with essays. I find I don't work brilliantly at home, so I go into college and in the Learning Resource Centre, where it is usually fairly quiet and you can always get a computer and you have all the resources that you need, so that is good. I make the most of personal study time within the day'. (42)*
>
> *'I dedicate my study time to night time when the kids have gone to bed. I start to study between nine in the evening and midnight.' (47)*

This section of the findings from the diaries has reported on the many ways in which the students reported that they were using technology to support their learning. At times the sheer creativity of the students astounded me, they were not all taught to use technology in this way but over time they have learnt from each other or picked up tips on how to enhance their learning. This section has identified the uses students make of technology for learning and at the end of the overall findings section I will discuss the impact on pedagogy. In the next section I discuss how students are using their personally owned technologies for supporting their learning.

### 5.2.2 How do students use their personal technologies?

In this section I consider how the growing importance of ownership of personal technologies has had an impact on how students use personally owned technology to support their learning. There is no clear demarcation between their use of institutionally provided technologies such as the university computers in the Learning Resource Centres and their

use of their own technologies; it remains a fuzzy and indeterminate border.[23] It became clear that a number of students owned laptop computers, but used them only for working at home and for accessing their studies from there. They did not always want to have the responsibility of carrying them around on their person when they were on campus for their studies. However the overall impact of higher personal ownership of laptops has been seen nationally in the design and provision of suitable learning spaces for students who can work wirelessly. No longer do we anticipate that students will sit behind static desks accessing books in the libraries or in fixed rows behind a series of computer screens. Flexible learning spaces have been the subject of much research in recent years for example the work at the University of Queensland *inter alia* and a look around Hertfordshire and other campus-based universities quickly identifies that students are now typically using the wireless network for checking their email in the university cafes or seeking comfy seating areas for collaborating on their work. The nature of student life has changed dramatically as wireless access to the internet has now become a standard feature of most university campuses including the University of Hertfordshire[24]. The diary students accepted the fact that they were expected to use their own technologies at times to access their learning instead of relying on the university's provision for all the technology they might need.

In the responses reported below in Table 13, the students at Hertfordshire present their views on how they are using personal technologies in their own learning and the comments incidentally record some of their personal attachment to their technologies. Students reported personal ownership of a wide range of technologies for learning and for leisure.

[23] Some university technology provision was of course specialist to their courses and unavailable personally, such as the manikins used by the healthcare students for scenario-based simulation training in the specialist research labs or the specialist software for graphics development. The rest of the week however the students would report using what they felt was most appropriate for them at that time and in that place.

[24] As can be seen from the student prospectus- www.herts.ac.uk

Small personal technologies such as handheld devices, mobile phones, mp3 players/iPods and digital voice recorders were reported as popular cross-over devices used for study and leisure showing there was a definite overlap across the 'fuzzy border' noted above between their use for learning and for leisure. A majority of students in FE noted their high use of USB memory sticks for transferring data between university or college and home. Others commented on the usefulness of watching television to supplement their learning especially a couple of the law students in the group who reported watching Prime Minister's Question Time. One of these also watched the Discovery Channel for legal cases.

**Table 13 Students' use of personally owned technologies to support their learning**

| Students' use of personally owned technologies to support learning | ID |
|---|---|
| *My own laptop. Without it personal research would have been a lot more difficult because I would have had to spend most of my time at the library, whereas having something of my own at home allowed me the flexibility I needed really.* | 23 |
| *Well if there's one piece of technology that I could absolutely not do without, it would most probably have to be my laptop or just a computer because I didn't have a laptop in my second year and it was difficult for me because I wasn't living on campus I live fifteen minute walk away.* | 20 |
| *My mobile phone helped me stay in touch with all my lecturers and my fellow students. It was a very simple way for me to find out information, organise study sessions, organise personal tutorials and just generally stay in touch with my fellow students just to see how they are,* | 58 |
| *Technology that I have used to support my learning has changed in the last year. It is basically the same i.e. using a Mini Disc recorder, but I also now use podcasts [from StudyNet]as well, quite frequently.* | 17 |
| *My Dictaphone, which I use when I'm conducting interviews for journalism, which is very very useful. I can record conversations that I have had and interviews and then I can use that to write up an article and make sure I get the facts right* | 36 |
| *My MP3 player, I use it every day, to download podcast so I can listen to it on the go,* | 20 |
| *The Mini Disc and laptop are only ever used for revision and learning and the PC iPod and mobile are all used for a mixture of both learning and relaxing* | 17 |
| *This lovely graphical calculator, which I had supplied by the university for my course. It does everything I need it to. I can write programs to help me, working out stuff like trying to do simple algorithms.* | 16 |
| *I depend on my phone, because it has an organiser application so I use this to schedule and structure my day and to list any important things I had to do that day. And I can access the Internet using my phone, but it's slower so I prefer to use the computer rather than my phone.* | 43 |
| *My mobile phone, my great Samsung … I wouldn't leave my room without it. It helps me because it has got a large memory capacity. I find it extremely useful, because I can record a whole hour of lecture and seminar.* | 28 |

Those students whose programmes required specific technical skills often had a wide range of personally owned technology such as this student studying Music Technology:

> *'I have a keyboard here, which is connected to this Mac and the programme, which is on a Mac right now is Logic, which is what I'm using for my coursework. Also I have a mixer, which is connected to my speakers, which is connected to this other computer, which I am doing my recording on right now as you can see, I also have a mini keyboard for this computer, and I have my mike and headphones and stuff, which is all connected to the main recording Suite, which is my Mac' (Student, 21).*

In summary, there was a high reported use by the students of personal technologies alongside their use of the university's provision of technologies for their programmes. The students would 'chop and change' from using their own technologies to the university's and the sheer quantity of different pieces of technology and websites accessed daily by the more technically adept of the students was a surprise to me since many of them were at least as competent as the IT focussed students I was accustomed to working with in Computer Science. StudyNet came out as a strong preference among all but one of the diary students, who disliked it because it did not offer enough flexibility for her art and design based course.

The use of social networking as highlighted in the introductory words of this chapter was very important to many of the students and in Table 14 below some of their comments on how it interfaces with their personal and study lives are presented. It is clear that there is no general agreement from these students on how far the use of sites such as Facebook should be part of their social or study lives and this finding was also replicated in the outcomes from the stage two interviews.

**Table 14 Students' Use of Social Networks**

| Using Social Networks | ID |
|---|---|
| *I have been using MySpace, Facebook, I also used Second life. (May 2007)* | 1 |
| *…Actually I use Facebook a lot for communicating to people within my team. We use it as more a casual way [of keeping in touch]* | 33 |
| *We have a Facebook group from a course which is really useful in posting things up to see when everybody is in and keeping in contact with each other and [we]put our websites out there so we can get feedback up from each other* | 44 |
| *…certainly everyone I know is on Facebook and people checking it religiously, so I don't think there would be any worry about people missing information or what have you. I don't feel that it is used enough really in an educational environment.* | 42 |
| *If I want to leave a message or a personal e-mail, I can do it on their Facebook account and it gets straight there. [Facebook] also builds up a friendly relationship between the two of you or three or however many there are and it builds up that relationship so that … when you do face-to-face meetings, you can meet up and work at it.* | 31 |
| *Really, we have our own sort of network there [in StudyNet], which I don't think the social network needs to fill in that gap.* | 23 |

### 5.2.3 How do students' experiences change through their learning journey?

In this section I draw on the outcomes of a longitudinal view of the student diaries. I highlighted in Chapters One and Four that a view of the learner's journey was important to me so that I could develop an understanding of the student experiences of blended learning over a period of time, rather than just taking a snapshot of their experience at a single point in the past. I pursue this research strand further in the next chapter when I consider the outcomes from the interviews with students.

The student diaries were searched for comments relating to the way in which their learning had changed since they arrived at the university. As I reviewed the diary material it was clear that there were in fact multiple strands to this changing relationship with technology used

for their learning as expressed by the students. Students had different starting points on their journeys including some who were mature learners; the students had used a variety of technologies or none prior to enrolling on their course and the metaphor of the journey was made transparent as they commented, unbidden, on how they had become more independent as learners and were relying on technology to support their learning.

I explored above the innovative ways in which many students used their personal technologies for supporting their learning. A small group of FE students (4), who were happy to volunteer for providing a diary were however wary of new technologies in the early stages of the diary recordings and were unwilling to use a webcam, preferring to use either a simple digital recorder or their own mobile phone.

In terms of learners' expectations and the types of technologies used by students, some of these students indicated that their prior use of paper and writing had changed to an increased use of online materials and the use of word processing for all documents especially their assignments. There had been an increasing use of technology to access study materials overall and this may have crept up somewhat unobtrusively for academics in recent years. For those entering HE especially as mature students, the high expectation of using materials which are only available online, registered as a matter of surprise for some of them. In Table 15 I report some of the comments the students made about the changing use of technology in their studies. They indicate a very high degree of reliance on IT for supporting their learning, regardless of whether their previous experience was using paper and pen or not. In the interviews in Chapter Six most of the students reported word processing their work prior to being an undergraduate.

**Table 15 The changing use of technology for supporting learning**

| The changing use of technology for supporting learning | ID |
|---|---|
| *I think nearly everything is IT focussed now, certainly everything you hand in has to be word processed, a lot of resources are now online.* | *42* |
| *I'm a mature student so my learning before university was very limited especially in the technology used so… the variety of technology that can be used to aid learning is probably the biggest difference.* | *17* |
| *The biggest change in learning I experienced will be because it's been such a huge gap between present education as a student and my previous one, technology has moved on so far from research done in the library with books with no online facilities, now [it's] at the click of a finger… going back to studying has been a huge learning curve for me so the technology that I can use was laptops and things which are now available out there on the World Wide Web which were not available last time I was doing this* | *49* |
| *The time I've spent on the computer has increased a lot… for 'A' levels most of it was hand written* | *4* |

Students in this study overall reported an increasing confidence in using technologies as they settled into university life and generally exhibited a willingness to try out things they had not previously encountered. A small number of the diary participants did however remain reluctant to engage with the new (to them) types of technology such as webcams for recording their diaries, as mentioned above, although they had no problems with StudyNet in the collaborative environment in the labs or learning resources centres, where they could easily ask for help.

While many students owned high-specification technology (not just their laptops, but Apple Macs and multi-function 3G and 2.5 G mobile phones which allowed web access), some had not explored all the functionality and preferred at first to borrow the technology provided rather than try to work out how to use, for example, the inbuilt facility for video recording which was on their own laptop. This borrowing was an indication of the variety of

experiences that students reported and the diversity of types of confidence displayed. What the majority reported in the diaries overall and is indicated in Table 16, was some increase in personal competence in using technologies. Measuring users' self-confidence with technology has been the subject of much interest anecdotally, since gender differences are often suggested as swaying users' own perception of their abilities, with males typically recording high confidence levels, which may not be matched by competence. What is reported in Table 16 is the students' own comparisons with their earlier competence, and a growing perception of confidence as their competence increases.

**Table 16 Student competence in using new and different technologies**

| Student competence in using new and different technologies | ID |
|---|---|
| *My use of technology has changed dramatically over the past year. I am definitely using it more to support my learning now than I was a few months ago* | *43* |
| *I am much more comfortable with using different technology now.* | *54* |
| *My learning has changed mainly because it's gone from physical to digital…from using pencils to do my drawings to using different mediums like Photoshop, flash and my pen tablet* | *32* |
| *I'm relying more and more on technology in this past year* | *6* |
| *I know what I'm doing now, especially in searching journals which used to be really difficult.* | *46* |

Developing as individual and independent learners became something of a refrain for the students taking part in the diaries as they reflected on how they had changed in their learning.They were not asked specifically in their diaries to explore how they had developed greater independence as learners but it was mentioned in different ways in their reflections. Independence and taking responsibility for their own learning emerged as being part of what it meant to be a student in HE (e.g. Paul, 1990 *inter alia*) and some of their views on

how they had developed to become more independent in their learning are given in Table 17.

**Table 17 Developing the skills of an independent learner**

| Developing the skills of an independent learner | ID |
|---|---|
| *Over the last three years I have studied independently more and more* | *22* |
| *Classes are a lot bigger and secondly it is very independent* (reflection of an FE student transferring to complete his HE studies at Hertfordshire ) | *20* |
| *My biggest change in learning is that learning in university is more independent* | *39* |
| *Probably independence with learning [was the biggest change] , our course is very based on you doing it yourself* | *44* |
| *In the last year it has become more efficient and easy for me to use technology and as I go along I expect it will get better*. | *41* |

The issue of learning to become an independent learner is taken up in greater detail by some of the interviewees in Chapter Six (see for example the experiences of an English Student and a Midwife). They reflected more specifically on the changes in their learning between school or college, where their learning was guided to passing exams, and their studying in HE, where one of the aims is to produce graduates skilled in managing their own learning.

As students became more independent as learners however, many of them commented how they noticed they were becoming more dependent on technology to support their learning. Table 18 reports on how students reflected on the changes they had noticed in their use of technology for supporting their learning through the course of the diaries, with many noting a real increase in the amount of time they were spending online. Students as

they grew older described themselves as becoming more 'mature'[25] as learners as they moved on either from FE-based study or first year undergraduate programmes for the early diaries in May or October 2007. The later diaries record that their use of StudyNet on the whole became more strategic and students would use its facilities to access journal articles and papers for their final dissertations.

**Table 18 Increasing dependence on different types of technology for learning**

| Increasing dependence on different types of technology for learning | ID |
|---|---|
| *My use of technology has changed dramatically over the past year; I am definitely using it more to support my learning now than I was a few months ago.* | 43 |
| *I wouldn't say it's changed as much as I have developed using it...I am becoming more dependent on it I suppose and I'm using it more.* | 23 |
| *I have used the Internet a lot more this year than I did last year, especially for finding more academic research, such as journals. I've learnt how to use Google Scholar, which I didn't even know existed until I came here.* | 4 |
| *I've been using a lot more journals and journal articles for research data to support the books that I have been using that I get from the library. I can access it wherever I am via the Internet and using my computer* | 37 |
| *My technology for supporting learning has changed a lot in the past year, as I have learned new programs for journalism, and I stopped using the programmes like SPSS, because I don't use them any more.* | *36* |

To what extent has technology become a central part of these students' lives? In the final set of student views in Table 19 on their use of technology for learning, some surprising comments are shared by the students about the impact of technology on their everyday lives. None of the students claimed to be using less technology than previously and many commented on the growing influence of technology for their learning and in their social lives.

[25] The phrase was used by students in the interviews to indicate a thoughtful approach to their learning borne out of experience and being the opposite of a hasty and careless online search.

One student had not used a computer before coming to university but was an enthusiastic user by the time he took part in the diaries. He had received plenty of support both through his course teaching team and from the Learning Resource Centre's support staff. Many other students reported relying on their informal network of friends, family and colleagues to give them technical support if they required it. Induction was noted for its introduction to the general learning support available but students often used the university's online guides such as i-SPY, at a later stage, when they needed to know how to access something.

**Table 19 The relative importance of learning technology in students' lives**

| The relative importance of learning technologies in students' lives | ID |
|---|---|
| *Technology is a big part of my life, both in working and playing, the first thing I do in the morning is to switch on my TV and my computer because I have to check my e-mails* | 26 |
| *I would say that I am getting to use more and more technology and I am relying more and more on technology in this past year...I'm getting inseparable without technology.* | 6 |
| *Well technology before, in the last year, I've basically used just to do the work. Now I am using it to find out how to do the work.* | 48 |
| *Podcast continues to be a great inspiration to the way I learn, I find it so helpful to listen to again and again.* | 9 |

### 5.2.4 Technology use by specific groups of students

In this section I return to my earlier point that some students should have special attention paid to their study needs because their background is different from, what I term as, the mainstream student body aged between 18 and 21 at entry. There are two categories that are particularly important here. They are the needs of the mature students and the needs of those with a recognized disability. There were 8 mature students who volunteered for the diaries, that is students over the age of 21 on initial enrolment. All but one of these was in

their twenties during their diaries and they had had varying exposure to using computers prior to enrolment.

Vuolo carried out a recent study on her own mature healthcare learners in HE and highlighted the special support that some of her self-confessed 'reluctantly online' learners needed to help them access and study online, support which should be provided primarily by their academic course leaders:

> *'A lack of pre-course preparation and a lack of organisational support compounded the poor experience with learners employing a range of coping strategies…as a result…It would seem then, that whilst MLEs can offer many advantages to mature learners, they do not always receive the benefit of them'(Vuolo,2010).*

The mature learners who volunteered for the diaries were not without their personal study challenges (they often had to manage their time carefully with their other employment or family responsibilities) but there was a difference between those registered for a full-time programme who had largely overcome any learning support difficulties prior to volunteering for their diary reflections, and those mentioned by Vuolo as registering for a short term and part-time course whose difficulties are reported by her.

There were three students who declared a disability on the confidential questionnaire; two were dyslexic and one was physically disabled and reliant on a wheelchair for moving around. I was pleased to have the wheelchair user among the diary keepers as it is too easy to assume that since the university already makes separate provision for the support of disabled students they may not have specific needs from using diverse learning technologies. The wheelchair bound student who took part on the diaries was in fact a keen user of technology and an enthusiastic diary participant. She lacked the fine motor skills to use a webcam or camcorder but was happy to record her experiences with a digital

recorder. From her reflections it is clear that she found the use of StudyNet was a real benefit as she could go online much more easily than she could travel with her wheelchair across campus. StudyNet was in her experience and that of the two dyslexic students completing diaries, a leveller of awkward paths and a very real support for their learning. The fact that StudyNet was designed to be easy to personalise ensured that students could set their own preferences for text size and colour and screen resolution.

## 5.3 Discussion and Summary

At the start of the chapter I set out the two research questions which this preliminary stage would address:

- How do students use technology to support their learning at the University of Hertfordshire?
- What is their experience of blended learning as students on a campus-based programme?

From an analysis of the students' diaries I suggest that the picture is a complex one. There is no suggestion that there can be a simple 'one size fits all' approach to the use of technologies for learning within this group of students and this finding has been borne out in a number of other similar small-scale studies, see for example Hardy et al. (2009) and Masterman et al. (2009).

Students are using various personally owned and institutionally provided technologies to support their learning at the University of Hertfordshire, as a ubiquitous part of their complex learning and leisure lives. Their own technologies, which are highly personal to them, as noted by Bennett et al. (2008), are used in surprisingly creative ways. Masterman has noted that '*technology remains part of the fabric of students' everyday lives,'* (2009:2).

Students who are registered for the face-to-face delivery of a campus-based programme of study are defining their own blend of learning activities when it comes to using both online support materials and study facilities provided for their courses. At the University of Hertfordshire their daily use of digital technologies included those that might be expected, such as StudyNet and those technologies which were unexpected to me such as the use of mobile phones to record lectures and seminars. This ubiquity of technology use and the breadth of ownership of technology among the generation of young adults have already been mentioned in Chapter One (JISC Ipsos/MORI, 2007; Caruso and Salway, 2007). This finding has been borne out more recently in the studies by Jones for the ESRC (Jones et al., 2010) and by Kennedy and Judd (2009) for the Australian Learning and Teaching Council. In terms of supporting student access to a blended learning environment the University of Hertfordshire's MLE was heavily used and highly prized by the students for accessing study materials, taking part in discussions, the opportunity for collaborating online on assignments and for keeping in touch with other students and academics.

Students expected to be able to access their materials easily and freely and they demonstrated a use of e-learning which happened around the clock and all through the week to support their learning. They also reported accessing material from other academic sites such as the Massachusetts Institute of Technology (MIT) Open Courseware programme. Some of those students who spoke about access to general information reported seeking out news online rather than watching television or reading a newspaper.

Thus they picked and chose what they felt would be useful and interesting to them, developing personal searching skills which sought out material strategically indicating a greater maturity in their learning strategies. This will be underlined in the details from the

individual interviews in Chapter Six below. All these students owned a mobile phone and 74% owned their personal computer or laptop. In findings which reflect the similar outcomes of Masterman et al.'s Thema report (2009:7) students were reluctant to bring their own laptops onto campus, preferring instead to use the university's provision of desktop machines in the learning resources centres. Podcasts, where these were recorded by academics of lectures or seminars and then posted for the students to access, were highly praised. They were used across a range of the faculties and praised by diverse groups of students from Nursing, Radiography, English and Philosophy among others. The use and benefits of additional online materials is supported through other research conducted into podcasting at the university, for example in Hilliard and Lorimer (2009).

MSN and mobile phone use were their preferred ways of contacting other students. Students also used their online social networks to keep in close contact with others informally, often several times a day, accessing these on their phones as well as on computers. There is some evidence for the use of social networks such as Facebook to support their learning but the boundaries are not drawn sharply and students on different programmes chose very different ways to communicate and keep in touch with each other and with academics. Many used social networks avidly, at the start of the recordings of the diaries in 2007 when one of the questions asked them about their use in general of social networks (Appendix 1 section i, May 2007 Day 3) but their use of, for example, Facebook was less frequently mentioned in their comments at the end of the final diary reflections in October 2008.

Email was generally used as a slower method of keeping in touch with people in more formal relationships such as those with academics rather than as a regular means of commuicating with friends and family, which happened via texting or social networks.

It has already been suggested that younger students nowadays tend to adopt a shallow and superficial attitude to searching for materials and using technology (CIBER, 2008). These findings however indicate that as students develop in their learning and their practice of using online technology through their undergraduate career, they typically adopt more careful strategies for planning and managing their time and for determining how they were going to retrieve and use information to support their learning. An example of this is the widespread use of searching for journal articles online to support their research assignments via the university's subscriptions to Athens and similar organisations. The importance of accessing external sites for specific research goals will be considered again in Chapter Six.

In terms of the differences noted by students during their learning journeys, the variety of types of technology and the importance of a reliable MLE to support their learning at Hertfordshire especially when off-campus are both relevant. In this set of students the differences were not recorded as problems but as points of change and growth. At the University of Hertfordshire these undergraduate students were successfully moving on during the diary period from either their 1st year or later undergraduate, to 2nd/3rd year of study or from successful completion of a Foundation degree to complete their Honours programme. Knowing that they have already managed the transition to higher level study resulted in general expressions of confidence about technology use from many of the students. This personally reported self-efficacy demonstrated by the students was evidenced in their generally high levels of confidence with using online technology. This has

previously been reported in my studies of the skill sets of new students entering HE (Jefferies et al., 2006; 2008) and has also been reported by Kennedy and Judd (2009) in their study of Australian entrants to HE.

This confidence with using technology in general led to a positive 'can do' attitude noted in the majority, although not all of these diary students. It may be due to the ready availability of formal technical support provided by the university as part of its investment in Information Systems provision, alongside easy access to on-line learning, but this attitude was not tested further. The small minority of students, circa 5%, who expressed an unwillingness to engage with additional new technologies were however confident in their use of StudyNet.

The older students among the participants that is, those over 25 at the start of the project did not let their lack of prior experience with using technology for learning deter them in their studies. They found the support they needed either informally from friends and family or through the institutional facilities for support and online help such as the popular i-Spy guides. One student in his late 20s reported never having had access to a personal computer before starting his course but had embraced using technology to support his learning with enthusiasm. The oldest student in the project was aged 51 and she started off using her children to help her solve her technology and access problems and to move podcasts off StudyNet and onto a digital recorder for her to listen to on her way to work. Two years later at the end of the diaries she reported how much more confident she felt as a graduate using a variety of technologies.

## 5.4 Conclusions

In this chapter I have presented the research findings from the preliminary stage of my research – a summary of selected diary reflections relevant to this study from the 54 students along with some of the statistical analysis of the participants. The analyses given in section 5.3 will be followed up by more detailed examination of the outcomes from both stages of the research in Chapter Seven.

This sample of students from across the University's programmes is of course too small to draw statistically relevant measures and that is not what the research set out to do. The aim of reporting their words here has been interpretive, and as I said in the introduction to this chapter it is to support my '*theory building*' about blended learning and the student experience. That is to present the students' experiences in their multiple facets as views of their own learning experiences in their use of many and varied types of digital technologies.

In this chapter I have reported how the students have spoken through their diaries about how they are blending their learning by using available technologies either personally owned or institutionally provided to supplement the materials delivered in the face-to-face sessions. They are developing strategies for finding material online and engaging with other students, perhaps through sharing documents online in group work or seeking out additional resources from other educational websites. For many of them technology needs no special introduction as it has become a significant part of their everyday lives and they report being 'always connected'.

In Chapter Six I describe the second stage of my research in detail, the use of semi-structured interviews with a set of the diary keepers. This next stage of the research explores in further detail how students experienced different pedagogical approaches in HE

and how they describe their experiences of the blending of their face-to-face learning and their use of digital technologies. Where Chapter Five has focussed on reporting the first stage of the research into the students' changing experiences of using technology for learning, Chapter Six returns to the third theme of what it means to study in HE, the pedagogy, and reports on the outcomes from the research design which were laid out in section 4.3.

The contribution to knowledge from this chapter is that students in this blended learning environment engage willingly and almost universally with multiple types of technology to enhance their learning in complex and diverse ways.

# Chapter 6: Researching the Learners' Experiences Stage Two

*'…the student's being in the world is more important for her learning than her interest in developing knowledge and understanding in a particular field' (Barnett, 2007:6)*

## 6.0 Introduction

In this chapter I introduce the details of stage two of my research into how students use a variety of technologies to support or blend their learning, when I interviewed a sub-group of the diarists and explored my proposed pedagogy/technology framework with them.

The preliminary stage reported in Chapter Five provided a good understanding of two of the main themes which I introduced in Chapter One, the students and the nature of their use of technology in their learning. As the results in the previous chapter showed, the students used a wide variety of technologies in their learning to blend their face-to-face experience on campus with the materials which were available online. Some of the students used technology in surprisingly creative ways and nearly all reported using their personal technologies to support learning at the university, whether this was for example listening to podcasts using their mp3 players, recording lectures and seminars on their mobile phones or transporting data from home to university via a memory stick.

In Chapter Four I introduced my pedagogy/technology framework which I wanted to test out with a group of students as part of my *theory building* with regard to students' use of technology for learning and their experience of different learning styles across their programmes of study at the university. The rationale behind this second stage was to seek further information regarding how students used and blended technology in their learning

and to examine further how students' learning and use of technology had changed through their time at university. The importance for my doctoral studies was to investigate the students' views of the pedagogies which they experienced and to demonstrate the potential of my meta-framework to link their experiences of pedagogy with their uses of technology to support their learning.

In this chapter I describe in section 6.1 the data gathering process which I devised for the interviews for stage two. In section 6.2 I explain more fully the design and use of the students' pictorial representation of their time as students, their use of technology and their study in HE using a set of Venn diagrams. In section 6.3 I present the student stories from the interview data and their own personal pedagogy/technology frameworks. In 6.4 I review the interview findings and the different outcomes from the students' Venn diagrams and frameworks.

## 6.1 The data gathering for the interview stage

### 6.1.1 The interview planning stage

As I described in Chapter Four, I planned for stage two of my study to comprise a series of semi-structured interviews held with volunteers from among the students who had previously engaged in the video diaries. I set out some general criteria for selecting the student set from which I wanted to choose interviewees. This would mean that their contribution to the interview would benefit from their prior reflections on technology use from as long an elapsed period of diary reflection as possible. The criteria were as follows:

- All of the volunteers would have completed a minimum of three reflective diaries between May 2007 and October 2008.

- They should still be available to participate in person on campus.
- There would be a mix of ethnicity and gender in the students.
- The set of volunteers would have studied on a variety of the university's undergraduate programmes and each was enrolled on a different programme.

The intention was not to have a fully representative sample of all of the diarists for this later stage, but to provide a range of backgrounds and a cross–section of opinions. I invited eight students in total to come to interview because I felt this would give a sufficiently multi-faceted view of the student experience for the purposes of my study and to test out my framework for pedagogy/technology.

An email was sent in April 2009 to those student volunteers from the earlier study who had completed at least three diaries, inviting them to take part in the next stage. From those who responded, four male and four female students were chosen for interview from a variety of the programmes of study across the University as shown in Table 20. The students in this smaller group contain representatives from each of the four Faculties; two of them started their studies with a foundation year in an FE college and the other six started their studies at the University. Two of them spent time abroad on study placements. All were in their final year of study by the time of the interview and were aged at least 21. The gender mix at the university is currently between 50% and 60% female.

**Table 20 Backgrounds of the students volunteering for Stage Two interviews**

| Student | Gender | Programme of Study |
|---|---|---|
| **1** | Male | Artificial Intelligence (AI) and Psychology |
| **2** | Male | International Business with German |
| **3** | Male | Digital Technology |
| **4** | Male | Business Studies |
| **5** | Female | Computing and Business |
| **6** | Female | English |
| **7** | Female | Philosophy |
| **8** | Female | Midwifery |

The interviews were conducted at the University of Hertfordshire between May 2009 and January 2010, with the majority of the interviews taking place through the summer of 2009.

Three artefacts were planned as the outcomes from the interviews, which would then be subject to further analysis. These were:

- a digital recording of the interview, which was later transcribed into a Word™ document.
- a visual descriptive record of their total use of technology in their personal and study lives compiled by each student using their Venn diagrams (see Chapter One and section 6.2 below).
- an individual student–constructed pedagogy/technology framework showing the pedagogies which they experienced for their modules and the technology balance (see Chapter Four and the student case studies in 6.3 below).

As part of my work over many years in Computer Science I have been both designing evaluation strategies and teaching the design process of evaluating user views at undergraduate and postgraduate levels. I was therefore comfortable with developing an interview strategy and designing the style of questions to use from the materials I had used professionally for evaluating Human Computer Interaction, for example Shneiderman (2010) and Dix (2004). In addition one of my roles in the past three years has been that of coordinating the evaluation of and for the university's Blended Learning Unit. I was accordingly very familiar with the planning and management of interviews.

In order to test out my planned interview structure and to ensure the comprehensiveness and comprehensibility of the intended questions with the diary students, I first undertook a pilot stage. Two undergraduate students and two recent graduates who were already familiar with the University of Hertfordshire's StudyNet and who were working in the BLU office but had not been part of the original diary project agreed to take part in an exploratory pilot interview stage with me. This pilot stage was run during early May 2009 and the interviews provided useful feedback from the four participants.

I provided a set of coloured paper circles for each participant in the pilot stage to create their own Venn diagrams. These circle diagrams which offered a different visual representation of the students' relationships with technology and their study from the pedagogy/technology framework did, as anticipated, provoke much debate, interest and discussion in the pilot stage and were later used unchanged in the subsequent interviews (see Appendix 6 for scanned copies of the interviewees' original diagrams and the digital versions which were developed from these for reporting and comparison).

As a result of the informal pilot interviews I decided that the interview questions themselves required no further development or clarification. My explanations of the use of the pedagogy/technology framework however needed to be made clearer to the participants and so prior to the final set of interviews I developed an additional short stage to the interview structure to present the framework and explain the four pedagogic styles in simpler jargon-free terms. After the questions and the student construction of their Venn diagram, I now first of all used a simple table of the descriptions of the pedagogies on their own (from my design in Chapter 4) with a blank space where they could fill in their modules. This was to assist the students in identifying the styles of pedagogy for each of their current modules. Then I presented them with a copy of the complete matrix on the framework so they could fill in the details on their own personal framework as they considered the use of technology for their learning. This helped to ensure that they clarified any issues over their pedagogical experiences before being presented with the framework to complete. If necessary they could review their pedagogy/technology decisions made previously as they transferred them to the framework. The descriptions of pedagogy on the students' frameworks were simplified as can be seen in the copies of some of their originals in Appendix 7.

### 6.1.2 The conduct of the interviews

The aim of each interview was to ensure that all the planned topics were included and the intention was to create a relaxed environment which would encourage the students to talk openly and freely about their programmes of study and their use of technology. The interviews were conducted in a quiet study room located in one of the university's learning resources centres, and normally used by students for group study. This was thus both a

familiar and a neutral environment for them. The interview format followed Creanor et al.'s use of the Interview Plus design (Creanor et al., 2006) and used material from their prior diary participation as the students were guided through a series of open questions. The interview questions are given below.

The students had already completed at least three video or audio diaries at six monthly intervals during the diary stage of the investigation and were very familiar with the format of being encouraged to reflect on their learning. They had all previously met me through the organisation of the diaries and the work of the STROLL project in the University's College Lane Learning Resources Centre, in the BLU office which was open plan and informal in style.

At the start of each interview I had a formal statement in which I reminded the participants of the university's ethical guidelines that the interviews were being held under and sought their permission for the interview to be recorded. I assured them that all their contributions would be anonymised and invited them to view their transcript at a later date. The interviews were recorded with a digital voice recorder and I made additional personal paper notes. The students could leave at any time. In practice they all expressed a keen interest in the outcomes of the diary project and were very willing to provide further verbal information about their use of technology and to try out the circle diagrams and the frameworks. The interviews lasted between 30 and 50 minutes, the difference in timing being due to the loquacity of some students and how long they took to devise their frameworks.

Each interview started with the student being asked informally about their course and their future plans as they drew closer to graduation and why they had volunteered for the video diaries. I encouraged each participant to reflect on their experience of compiling the diaries

with the question 'Did your learning and your use of technology change over the time you were recording your diaries?' The remaining questions explored the issues around using technology in their learning at Hertfordshire:

- How did you use technology in your learning?
- What is the benefit, if any, of using technology in your learning?
- How did your tutors use StudyNet as an online resource?
- How does your learning take place?
- How was technology used to support your learning?
- Did the use of technology to support your learning change or vary in your undergraduate years?

Approximately half of the interview recording time was taken up with discussing the question topics, the remaining half was devoted to discussion of the Venn diagram descriptions and the pedagogical framework. Thus there was a semi-structured approach with a common set of prompt questions, using the students' previous experience of reflecting on their use of technology. In practice the interviews moved around from one point to another and therefore the order of the questions differed for each student. At the end of each interview I thanked the students and then shortly afterwards I recorded my set of personal research notes to ensure that all the information gleaned at the interview was fresh.

The circle diagrams produced by each of the students and the original frameworks were digitally scanned and are included in Appendices 6 and 7. I developed a digital version of their original Venn diagrams and frameworks because it was easier to share them than the images produced from the scanner and I could show more clearly how the frameworks were

used. I describe what they represent in more detail in section 6.2, before I present them individually in the mini-case studies in section 6.3.

### 6.1.3 Recording and analysing the interview data

After each interview the digital recording was transferred to a password protected personal computer and then backed up onto a personal area on a secure server. Once the digital recording had been saved on the PC and backed up on the server the recordings were deleted. My personal notes and the students' diagrams were kept in a locked desk drawer, located in an office which was locked when not occupied.

I transferred the personal framework diagrams into a Word™ document so that they could be kept in a digital format. I faithfully represented the students' positioning of their text on the diagram, using multiple text box positioning to get as close to the original as possible. Their diagrams were then stored on the PC with the recordings and the originals were preserved with the researcher's notes. The scanned images of the students' Venn diagrams and frameworks (see Appendix 6 and 7) allow comparisons to be made between the original and the digital version.

A transcript was made of each recording; these were contracted out to a professional company. Each transcript was then checked again so I could make necessary corrections. An iterative review process was used to capture the data from the first part of the interviews when the students described their use of different technologies to support their learning. This first part of the interview lasted for approximately 15-20 minutes and was structured so that for each question on my sheet I was able to identify the students' answer, even where the ordering in the recording had been different, and follow the line of verbal interview. I reviewed my transcript notes taken at each interview many times and I listened to the

recordings repeatedly to ensure the students' key words and phrases were accurately and concisely obtained. For my records, I colour coded student responses which enabled me to keep a track of how they answered different questions. I did not use NVivo™ for this set of data analysis because of the small number of interviews and the comparatively small amount of data and my preference for listening to them over again on an iPod when I was not always near a computer. This does not diminish the value of using Nvivo™ for the earlier diary stage because of the multiple themes followed and recorded then and because it made it easier to cross check a large data set.

The interviews were used to build up the mini-case studies of each of the students' experiences referred to in Chapter Four. They are presented anonymously in the third person in 6.3 below as a set of 'experiences' with quotations taken from the students. Originally the style of a 'story' was considered but the snapshots provide a view of their experiences rather than a personal narrative. Each student experience is described in a similar pattern:

1. An introduction of the student's background and studies,
2. A discussion on what they learnt about their learning as a result of the video diaries
3. The student's reflections on the use of technology,
4. An analysis of the three themes using the Venn diagram
5. The different ways they approached their learning based on the pedagogies to which they were exposed
6. Concluding remarks.

Similarly to Barter and Renold (1999), I had originally planned to call these studies 'vignettes' since I sought to provide a distilled version of the students' original descriptions

of their actions. They provide an excellent introduction to the use of 'vignettes' in qualitative research when they describe the technique as: '*a method that can elicit perceptions, opinions, beliefs and attitudes from responses or comments to stories depicting scenarios and situations' (Barter and Renold, 1999:1).*

Further exploration of the term and the context of its use in qualitative research showed me that it was not an applicable term to use in my study. From a technical stance in qualitative research it required an engagement by other participants with the content of the '*stories*' (Hughes, 1998), whereas my use of the term was intended as a means of presenting the content as the students' own views of their learning.

Consequently, I have returned to their description as mini-case studies where the student's name has been changed to a pseudonym to protect their identity and enforce anonymity. He/she is described in terms of their relationship to the subject they studied and how their learning was or was not supported by the use of different technologies. This process is similar to that used by others, including Masterman's team when conducting their 'e-pen pal' research with postgraduate students at Oxford (Masterman et al., 2009).

The subject-based nature of this approach was chosen because the students' learning and their use of technology was described by them as being fully integrated with the subjects they were studying. The examples they used reflected their engagement with their studies on their modules, for example the student of English literature enthusiastically discussed some of the advantages of online study and of being able to take a specialist module in Native American literature, because this unique and rare material was now available and discussed online. Previously this material had only been available physically in a remote location and at a great cost for non-locals to view. The Philosophy student discussed the use

of Facebook by staff and students as a way of generating and supporting informal discussion around their seminar topics and the 'pub discussion group'. The Midwife reflected on a more formal style of teacher-directed learning within the classroom, where the use of technology was limited to PowerPoint™ slides and StudyNet was used as a repository for lecture materials instead of for its wider purposes of supporting a variety of online learning styles.

The rest of the interview transcripts related to the use of the pedagogical framework and included the students' visual representation of their HE experiences with technology through their intersecting Venn diagrams and these are described in detail at the end of each student's case study. The personal side of each student's relationship with their studies and technology, as opposed to them being merely a product of their programme of studies is represented through the use of the second artefact from the interview, which was the Venn diagram and the basis for this is described in the next section.

## 6.2 Using personalised Venn diagrams to represent the student's experience of blended learning

In this section I outline the reasons behind the design and use of the Venn diagrams which I introduced to each of the interviewees as a means for them to explore their experience of technology in their studies and personal lives. The diagrams were first mentioned in Chapter One. Figure 6.1 below is used as a means to explain the intersection of the triple themes of my work; the use of technology for learning, the HE student and their HE studies.

A number of researchers have refined the use of Venn diagrams as a means of presenting views on educational experience as discussed in section 4.2. My own interest lies with providing a simple model with which the students can interact to represent their view of

*studying* in a blended learning environment. Hence the diagram comprises three circles which represent a student's view of the main themes of this study. From the student's view they are intersecting the circles to represent their own opinions of their use of technology at the University of Hertfordshire. This diagram does not seek to represent pedagogy in HE since that is included in the framework discussed above and below, but it does offer the students the opportunity through the broad description from the blue circle (2) of their studies to identify the amount of time spent on their studies outside their use of technology, that is to separate out studies from technology if they wish to.

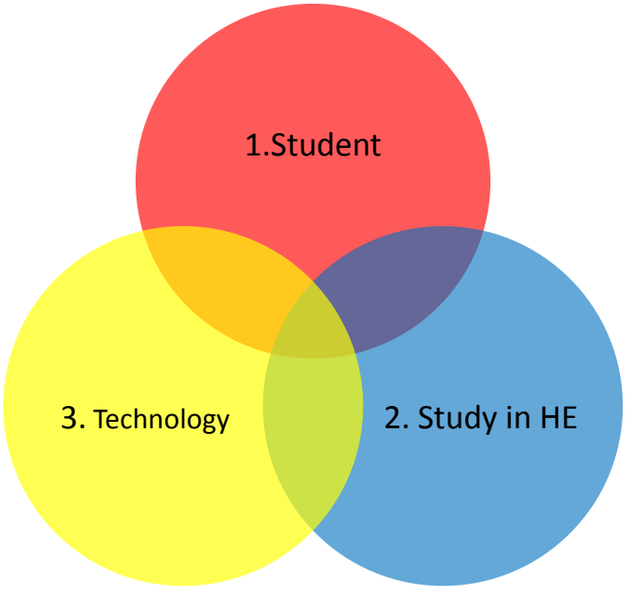



**Figure 6.1 The coloured circles of the Venn diagram**

I suggest that the attractions of the circle model lie in its visual simplicity and the use of primary colours. However, this is somewhat deceptive as there are seven sections in total to the diagram rather than the initial three seen when the circles are separated out. The additional four sections are identified by their combination of colours (purple, green, orange and brown) and from their intersections with one or more other circles. In Table 21 below I identify what each section represents.

**Table 21 The seven coloured sections of the Venn diagram representing the student's engagement with technology and their studies**

| Title | Colour and Intersections | Representation |
|---|---|---|
| **1. Student** | Red | The student studying at UH |
| **2. Study in HE** | Blue | The learning and teaching environment |
| **3. Technology** | Yellow | The use of personal and institutionally provided technologies |
| **4.Student 1/Study 2 Intersection** | Red/Blue = Purple | The Student/Study section is the Student in their relationship with the Study environment at UH. This represents the student in their daily contact with staff and other students in the classroom and their use of study materials |
| **5. Student use of personal technology outside Study: Intersection of 1 and 3** | Red/Yellow = Orange | Students have plenty of contact with technology outside their specific study environment and this sector includes personal use of technology such as computers for leisure, mobile phones, mp3 players and use of TV, games etc. |
| **6. Technology used to support Study in HE: Intersection of 2 and 3** | Blue/Yellow= Green | This sector includes the institutional provision of technology to support study. This primarily incorporates StudyNet but will also have the remit of hardware and software systems used beyond the MLE for example in healthcare studies and engineering. The important factor to note here is that the technology exists to support Study in HE independently of whether it is actually used by the students. |
| **7.Technology used by the Student to Study in HE: Intersection of 1,2,3** | Red/Blue/Yellow=Brown | This sector is the intersection of all 3 components of the study and is the use made by the student of technology in their studies in HE. |

I used the Venn diagrams in the interview stage to explore with the students how they saw their own use of technology in their studies. In effect this was describing their own

experience of blended learning. The Venn diagrams were separated out from the pedagogy which the framework additionally identified. The students were presented with three coloured paper circles and they were invited to construct a personal diagram of overlapping circles to identify how much technology and study played a part in their lives. They were presented first with the red circle to represent themselves as a student, then the blue circle to represent their time studying in HE and finally with the yellow circle to represent their use of technology. The students could manipulate the circles until they reached their final choice of representation and as can be seen from the digital images of the final diagrams at the end of each student's experience (Figures 6.3.1.1 to 6.3.8.1) they sometimes moved either the blue or the yellow circle on top of the others. The results were frequently very surprising to the students, when they reviewed the extent to which technology dominated their lives. I was not participating during their construction of the diagrams except to offer an explanation of what each circle represented and to encourage them to check at the end whether they were happy with the final diagram. This was then physically stuck down on the back of their framework diagram to preserve it before I scanned it as a separate image.

At the end of each mini-case study presented below I discuss the student's use of their circles and and their pedagogy/technology frameworks. Then in the next chapter I critically review what the circles indicate, when I review the overall outcomes of the student interviews.

## 6.3 The Students' experiences

In this section I present the individual stories of the students' experiences from the student mini-case studies.

### 6.3.1 A Philosophy Student's experience

'Ellen' studied Philosophy (major) and English Language (minor) at the University of Hertfordshire and graduated in 2009. She joined the video diary project at the end of her first year and continued through the following two academic years. She was an enthusiastic volunteer for the video diary project and describes why she joined the project:

> *'… it was just really intriguing. It came up on StudyNet about recording your daily life and I just thought it would be really cool [to volunteer].'*

Later she added

> *'You just take it [technology] for granted and doing these studies makes you realise that technology is a massive part of your life.'*

Through her video diaries, she had spoken with enthusiasm of her use of technology to support her learning and was particularly in favour of the way her lecturers in the philosophy department would use podcasts to support their classes. She used them particularly to '*listen to over and over again, to understand key concepts in literature and philosophy'*. She described in one of her video diaries (October 2007) how she had rigged up an mp3 player in her car to be able to listen to the podcasts on her way to and from the university, work and home.

She went on to speak about the functionality of StudyNet and the opportunities for using technology that her lecturers had made through their classes. From her point of view her lecturers were creative in their use of online materials to support student learning, for example they placed video links into their slides for the students to access again from their StudyNet portals after the class had finished.

> *'I mean you really appreciate what it is that you do and what the university provides you with… when you first get here it's just like 'oh well it's just a computer'. They've*

*just given me the internet. What difference does that make? But then you realise how StudyNet contributes to your learning.'*

This student was particularly reflective on the way she used technology day by day for her diary and ascribed this to the analytical skills she had acquired from taking Philosophy as her major subject of study. This in turn led her to investigate further into what technology was available and what else she could access on StudyNet. This became for her, as it had been for some of the other diarists, a virtuous circle, where seeking to find more information led to a greater discovery of the potential of using an MLE technology such as StudyNet. Her early experiences of being a student in her first year of university study and of using technology to research and support her learning had been somewhat haphazard. As she describes, there was a heavy overlap initially between the technology she used for study with her use of technologies for personal and social use:

*'…in the first year it was more of 'I'm on the computer because I'm on Facebook' or 'I'm doing this that and the other'whereas now it is literally you are on the computer, you are doing your work and there are so many things that have changed. I mean like I say being able to access journals, you end up learning how to work your way round those journals…It took me into the second year to realise that I could actually download journals from home'*

The changes she charts showed an increasing dependence on her use of the internet for accessing supplementary materials for completing her work.

*'…in the first year if I was to write an essay it would just be an essay with random bits in it and whatever, whereas now [I'm]taking out piles of books and getting hundreds of journals and whittling it down to, you know, the most important ones that need to be into it.'*

Crucially she identified her reliance on the internet for accessing materials,

*'I think it's because the technology's there to be able to access it.'*

Alongside her description of a growing 'maturity' in attitudes to her learning and searching strategies with using different approaches to her learning, she described an increasingly busy life which included part-time jobs and regular involvement in the Philosophy Society's discussion group in her final year. This latter group met regularly to discuss philosophy at the pub, the so-called 'pub group' and also online via Facebook. Facebook was used actively by both staff and students in her department to carry on the discussions started in class and in the informal pub-group. This was one of the few examples among the students of the crossing of the formal staff/student relationship into the informal realm that Melville (2008) mentioned, so that the online Facebook group was used apparently by most of the Philosophy students and academics in preference to the discussion facility on StudyNet.

Similar to other students mentioned in the diary section she managed this balance of study, work and leisure by a balanced use of the materials available online to support her learning. She described how on a Sunday evening she would finish work, collect a pizza and then come into the Learning Resources Centre to study. There may be an irony here that she chose to come into the university to go online but this can be explained by the relative peace and quiet for studying at the university and her choice to remove the other physical distractions of family and friends. Ellen is a confident user of technology in her private life, mentioning many electronic games that she played. In her study life she had already been introduced to a type of MLE while still at school. She compared the design of StudyNet favourably with a former school friend's experience at another institution where there was much reduced access to materials online for his studies:

> *'…the one we used at sixth form was actually better than the one he uses at university. It's more enhanced and you could do more with it. The one he has it just literally links you to your email and a few other bits to the university'.*

In summary Ellen described her use of technology as almost total:

> *'Part of me is trying to think of a part of my life that isn't affected with technology, because there really isn't any.'*

When she composed her own Venn diagram from the coloured circles showing her life as a student inside and outside university and the role of technology in her life, she identified technology as virtually overlapping her life outside the university and the amount of time she gave to study, as shown in Figure 6.3.1. The yellow technology circle overlaps the red student circle almost completely, indicating what she described in her interview that technology plays a very large role in her daily life. Ellen described her life as being very full as she was working part-time to afford to go travelling the following year and to pay off her student debts. Despite her descriptions of working hard she chose to show in her circles that study (in the shape of the blue, background circle) did not dominate her life.

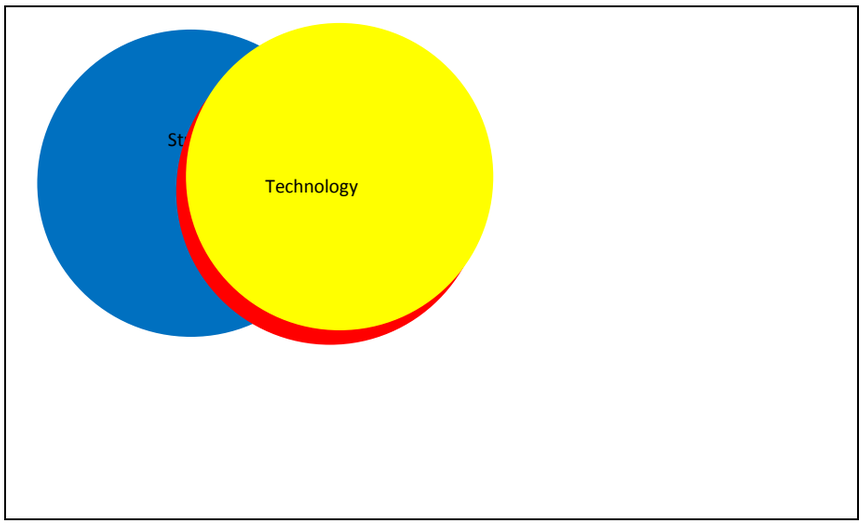



**Figure 6.3.1 A Philosophy Student's experience – Ellen's Venn diagrams**

Ellen's interview was one of the longer ones as she was keen to discuss and describe the different styles of pedagogy which had experienced during her student life as well as

justifying why she placed her final year modules and other activities in the places she did on her framework.

Her personal pedagogy/technology framework in Figure 6.3.1.1 shows a strong engagement with technology across her learning. Ellen approached her framework differently from the other students by describing the generic style of her lectures and the other materials she was using. The lectures were placed in the bottom left-hand segment – face-to-face and instructivist, even though she commented on the technology that was used in class to show video clips that were linked via the PowerPoint presentations to Youtube. The importance of the informal Philosophy pub discussion group to her studies is emphasised by its inclusion in the top left hand segment. She describes this as situative in context, a place where everyone is supported by the rest of the community:

> *'…So then after [the philosophy society meeting] we go with the lecturers and sit in the pub and just discuss whatever's been said in the society. It's really good because it really does help you progress in your learning because even just discussing language and whatever…it really does extend [your understanding and] things.'*

The majority of her classroom experience is described as being within a constructivist framework of building her understanding either on her own or socially, which was her personal preference as a style for learning and based firmly in the blended learning column. She commented that while some of the lectures were *'brilliant'*, others just delivered material that she could have gone and researched herself. The FIT student module shown was a fully online course for developing graduate skills which was run by the university and certificated to support students in their job searching and future employability.

Ellen's framework (see Figure 6.3.1.1 below) shows a broad mixture of pedagogical approaches to her studies. When her interview comments are considered in line with the framework she reports on a strong enthusiasm for blending online materials combined with the importance of face-to-face contact with academics.

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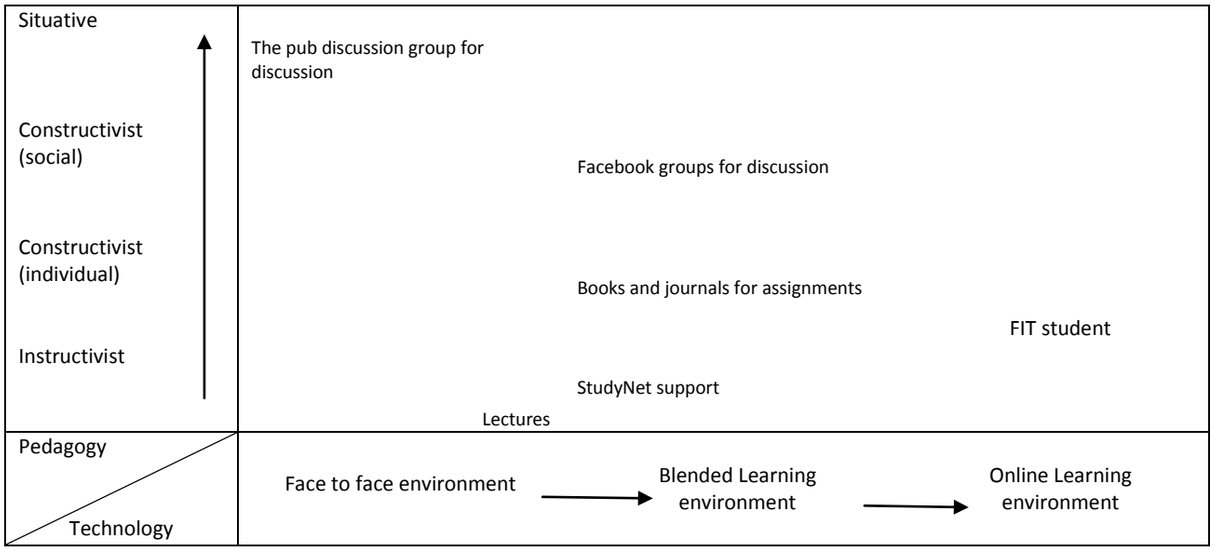



**Figure 6.3.1.1 A Philosophy student's pedagogy/technology framework - Ellen**

### 6.3.2 A Computer Science Student's experience

**'**Hannah' studied on the BSc Joint Honours programme with Computer Science as her major subject and Business for her minor. She began her studies at a local FE College from where the Foundation year leads into an extended degree at Hertfordshire. The group of friends who joined the university from the college at the same time as she did, have been very important to her for both settling in and working together and she noted how this influenced the way they worked together and have continued to provide support.

> *'...so for us because we did our first years elsewhere it's just been a bit different to adjust to it but we are looking out for each other because most of us are doing the major in computing and there's only one or two of us who are doing the major in business. We help each other. So when it comes to computing we help them and when it comes to business they help us. So it's good as in I find that group learning is easier, because if I know something, someone else can help confirm that what I know is right and then they can tell me something and we just help each other. So...I think that's the learning I really like that's been really effective.*

She mentioned how fond of technology she is, for its own sake:

> *'Computing is what I love to do and I'm always getting extra stuff. I have three USBs… I've got a web cam, I've got a phone. Compared to most people I know I have got a few more technologies.'*

She described herself as *'always on line'* and found that using the diaries had brought to light how much she was relying on having technology to hand right through her everyday life. From the moment she woke up:

> *'I think the thing that shocked me was I didn't realise until I actually did the diary how much I used technology every day and also I don't think I was aware of the routine I did every day, like go onto StudyNet, check my other email, go to Facebook. I think it just*

*became natural. It was just all routine and it wasn't until I started documenting it for the diaries I was like, wow, I really use a lot of technology.'*

Her life was by her own admission dominated by study and technology:

*'I have to say pretty much my whole life is technology…Actually going on the computer is the first thing I do in the morning, the last thing I do when I go to sleep...technology takes up a large chunk of my life.'*

Hannah spent a year studying in America as part of her degree and reflected on how she found it hard to manage with less powerful technologies when she first arrived. Most of the US students had their own laptop while Hannah did not have her own at that time. Local research at the university and elsewhere (see section 5.3) has revealed that many students were unwilling to carry expensive personal items such as laptops around with them. Hannah had to buy herself a basic phone in America and commented:

*'…and it took a long while for me to adjust to because I'd used a coloured screen and this was really basic.'*

On her return to UH for her final year she commented that she relied far more heavily on accessing e-books and on-line journal articles, which marked a change in the way she was developing a blended approach to her studies.

*'The first year was pretty much mainly using books and discussing in our group. It's only in this final year that I've discovered online journals and they are pretty useful.'*

Hannah's Venn diagram (see Figure 6.3.2) shows a similar wide overlapping of the student and technology circles as Ellen's and some of the others. The difference is that she acknowledges that a greater part of her time is spent in studying and this is almost exclusively online. This might be expected because of her technology based subject. Her summing up of her attitude to her studies is encapsulated in the comment she made about her study and personal lives:

*'Technology, I just love it!'*

Hannah's Venn diagram shows the extent of the almost total overlap between the person (red) and technology (yellow).

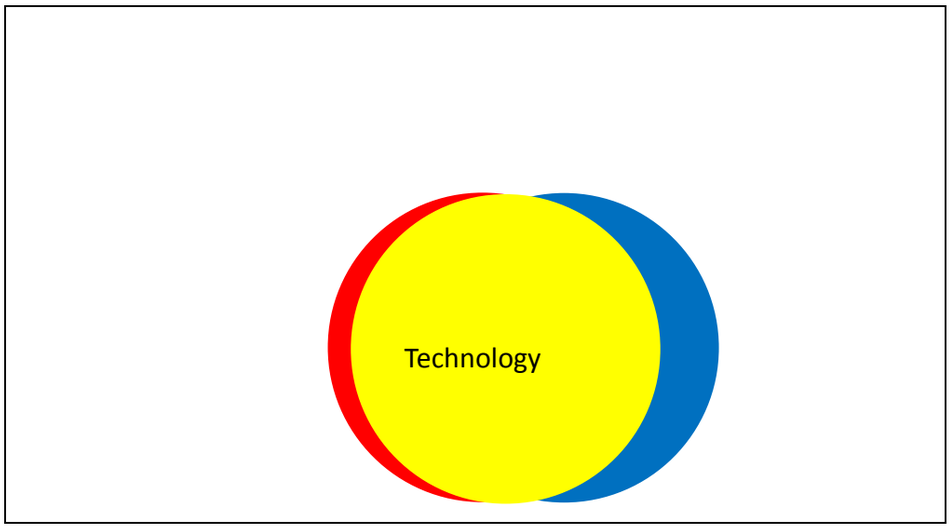



**Figure 6.3.2 A Computer Scientist's Experience – Hannah's Venn Diagrams**

There is in fact very little difference in Hannah's description of her Venn diagram between her use of technology and that of Ellen the Philosophy student's despite them studying on completely different types of programme, one from Humanities and one largely from the Science and Technology faculty.

In terms of her preference for the amount of technology in her learning environment and the option of a blended approach or a face-to-face approach, Hannah, in line with her previously stated use of technology all day and every day, came down in favour of using a blended approach, accessing extra support materials from other universities, although not all her business modules offered an equal amount of online materials to the students.

*'All my computing modules have been a mix of StudyNet and researching online and then meeting up, depending on the topic we might have been taught or how it's been presented ...when you do a search for extra materials you always come up with a lot of materials from American universities and their slides…And it will come in very handy. There was even one for one of our modules …some simulation diagrams that helped to show it better.'*

In her framework (see Figure 6.3.2.1 below) Hannah sets out very clearly a strong bias for a blended approach through the middle column but with a mixture of styles of teaching for most of her classes. While she gave the impression in her interview of much group support from her small community of friends in her learning, she in fact separated her learning out into being mainly blended, and the pedagogy into a range of styles while expressing her preference for working together in a group of her peers face-to-face.

The FIT student online module is described above in 6.3.1.

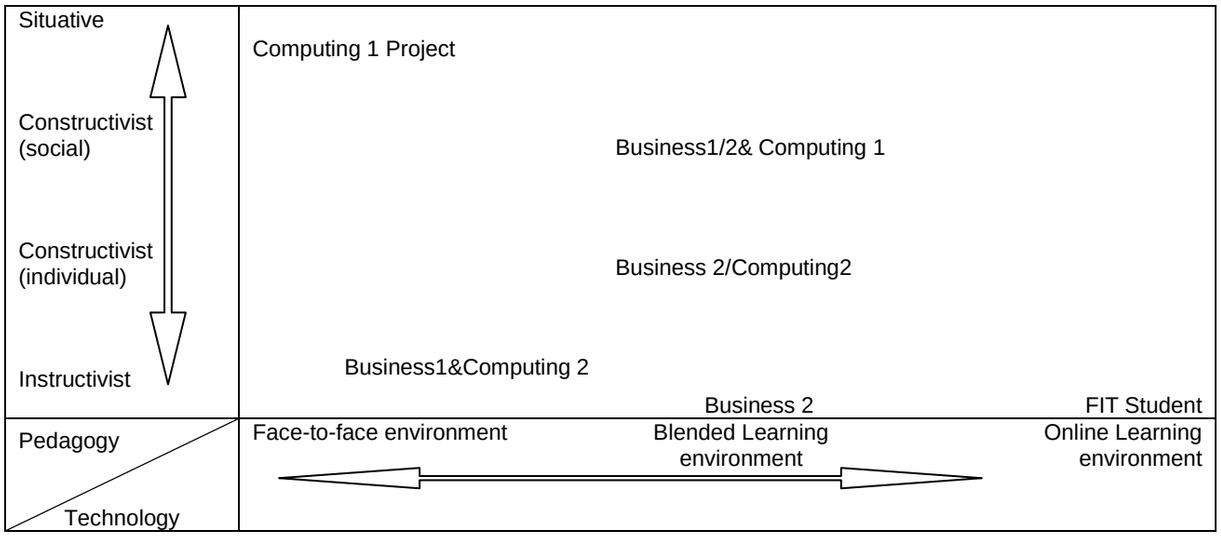



**Figure 6.3.2.1 A Computer Scientist's pedagogy/technology framework - Hannah**

### 6.3.3 An International Business Student's experience

'Dave' has spent four years enrolled on an International Business studies undergraduate programme. His studies have included periods of time at universities in America and in Germany. As well as being a full time student he also has a hobby in graphic design and works part-time designing posters for his freelance business. He was typical of the interviewees, within the members of this small group, in that he seemed to fill his day with a mixture of study and other activities and reflected on how he preferred to be busy. He had volunteered to do a video diary because:

> *'I decided early on in my university career that I wanted to do as many sorts of unusual projects and try as many new experiences as possible, because it is very easy to just spend your whole career with your nose in a book and you don't really learn anything …it seemed like a really interesting project and yes was really useful …to do.'*

Like 'Ellen' his time includes plenty of busy work and social activity and much of this is carried out through personal and mobile technologies, such as his mobile phone and his use of social networking sites which he now uses for keeping up with study groups as well as for non-university socialising. On reflecting on his use of the video diaries and the growing influence of technology in his study life he commented that this had started before he left school:

> *'We were part of the generation that were just starting to get the electronic whiteboards, so I started to see that, towards my later school career.'*

The diaries had played an important role for him as taking part had helped to identify for him how much use he made of technology in his study environment:

> *'It forced me to look at my study habits and it made me much more aware of how technology is part of every facet of learning nowadays … once you are forced to talk about your everyday life you realize, well, I do spend all day in front of the computer,*

*in the library or the computer at home or looking at overhead screens in lectures, or submitting essays electronically and you think, oh well, it actually is a huge part of my degree.'*

He described his study lifestyle as being on-line almost continually but with his study split into 'bite-size' pieces.

*'…the way I work I will be typing a bit for an essay, then I will check Facebook to see what is going on and then I will go back to this, then I will check Twitter or check my email and, yeah, I am a lot more flexible in going between, now I am working hard, now I am relaxing'*

He described his own growth in maturity in his studying and his developing personal strategy for success in his studies over the past three years.

*'…Definitely [matured]. I feel by now that I know how to play the game, as it were, like I know going into a new module that I need to know what is the assignment, what percentage of it is going to be an examination. I know I need to be taking notes and then I need to put them on cue cards because that is the way that I learn best…now because I am 4$^{th}$ year I am doing a lot more research for my essays and a higher and higher percentage is coming from other websites or online journals, online textbooks.'*

In reflecting on his experiences of studying abroad he had found that in Germany there was far less use of the internet for personal study and research. Both the style of teaching and the opportunity to access materials online were completely different from what he had experienced at Hertfordshire:

*'I went to the university in B+++ [and] as far as the internet went there was very, very little being used. I mean the library was pretty much just a room and all the learning was through 4-hour long lectures, which was extremely hard going from this [my daily use of StudyNet] to that… I would say that the level of technology use here was far higher than it was there.'*

The teaching style was very different in the German University too, not just in terms of the access to technology. Students there were required to attend the lectures but not necessarily to engage independently in their studies through their own initiative:

'*…there was a lot less emphasis on … self directed learning. You know, we are going to be studying this topic, go and look online, go and find this, find that, find real life examples, [so that] here you feel very empowered*.

For Dave, his ability to easily go online and access materials had led to his personal ownership of learning, which he described as empowering, rather than being on the receiving end of long lectures, where he did not feel the same ownership of learning. Of his time in America he also noted the lack of available technology for students to use in terms of publicly accessible computers in the learning resources centres and commented that:

> *'It [technology] was very comparable in America. I think there was slightly less. We have got far more computers here than they do.'*

In common with Hannah, the Computer Science student, Dave noted that many US students had their own computers and did not use the university provided ones, which led to an overall poorly funded provision of institutional technologies and shorter opening times of libraries and learning resource centres.

Dave was also a very keen user of Facebook and combined this with his studying as Ellen had, although there was no mention of input from his lecturers in Dave's case.

> *'I found that they [schoolwork and leisure activity] are not mutually exclusive, like you could be on Facebook and in the library and that doesn't mean that you are just having fun with your pictures; it is actually very integral to a lot of my classes. For instance I am doing a small business entrepreneurship class right now, so we have to start our own business and we have been using Facebook from the start, we have got a group*

*page for ourselves to decide …who is writing this, then we have got a page for our business which we invite all our friends to as a form of advertising.'*

Dave's use of the Venn diagram, see Figure 6.3.3 below, to identify his use of technology and the balance of his time as a student shows a great similarity with Ellen's diagram in spite of neither of them studying a technical subject. He placed his blue study circle over the others at the end but the almost total overlap of the yellow technology and the red student circles is strikingly similar. This is perhaps not surprising when we consider his original description in his diaries of his constant use of technology from the moment he woke up:

*'…the first thing I do in the morning is switch on my TV, switch on my computer because I have got to check my email accounts, and my hotmail and my Facebook'*

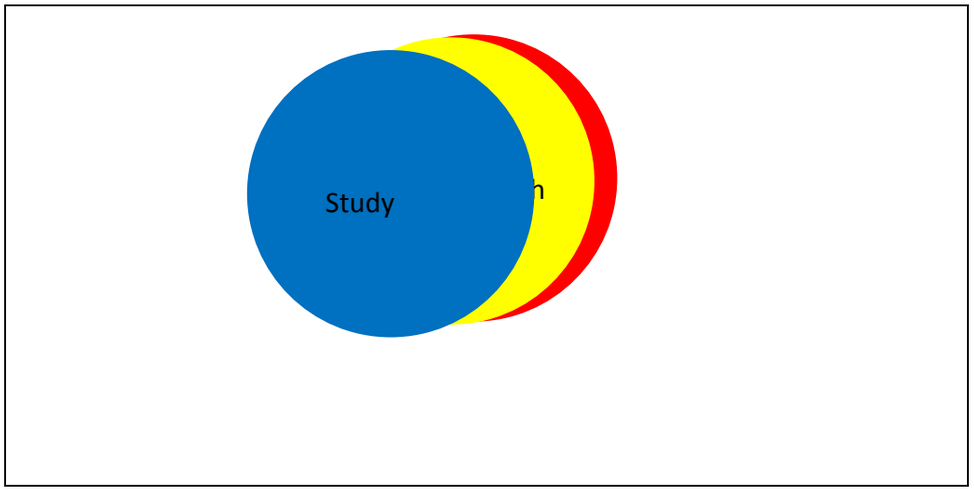



**Figure 6.3.3 An International Business Student's experience - Dave**

Dave's discussion around his framework (see Figure 6.3.3.1 below) identified that many of his classes were teacher-directed and instructivist in style, an approach which he was comfortable with:

*'I do enjoy being teacher directed because it is the most efficient way of them giving you the knowledge that you are going to need to write your assignments, for you to do*

*whatever you are going to be graded on. So that is very effective sometimes and providing that you have got a charismatic lecturer…'*

He was the only student to consider the use of an instructivist approach as being efficient and this is perhaps due to his business studies context. There was a notable lack of use of any podcasts in his experience of learning, which had been so useful for Ellen, and the use of electronic voting systems in class which while very common in his American university classes was not being used by his lecturers in the UK.

Dave talked enthusiastically about organising groupwork with the small group of students who were following the exact programme as he was and how they would use all sorts of online and offline technologies for communicating with each other. He spoke warmly about the use of technology in his classes and after his experiences in other universities he was keen to praise the provision at Hertfordshire. The most productive classes for him were the ones where he collaborated in a social setting because of his enthusiasm for working and being in the company of his peers through the day.

Dave, Ellen and Hannah have all indicated a high degree of use of technology in their daily lives and the placing of their yellow and red circles are very similar. Dave uses technology extensively and in a highly competent way but is content with a more teacher directed style of learning when he can blend that with his own research. His experience of learning in Germany identified for him that being taught in a purely face-to-face environment with no online supporting materials was very dull and did not offer a personally satisfying approach to his studies.

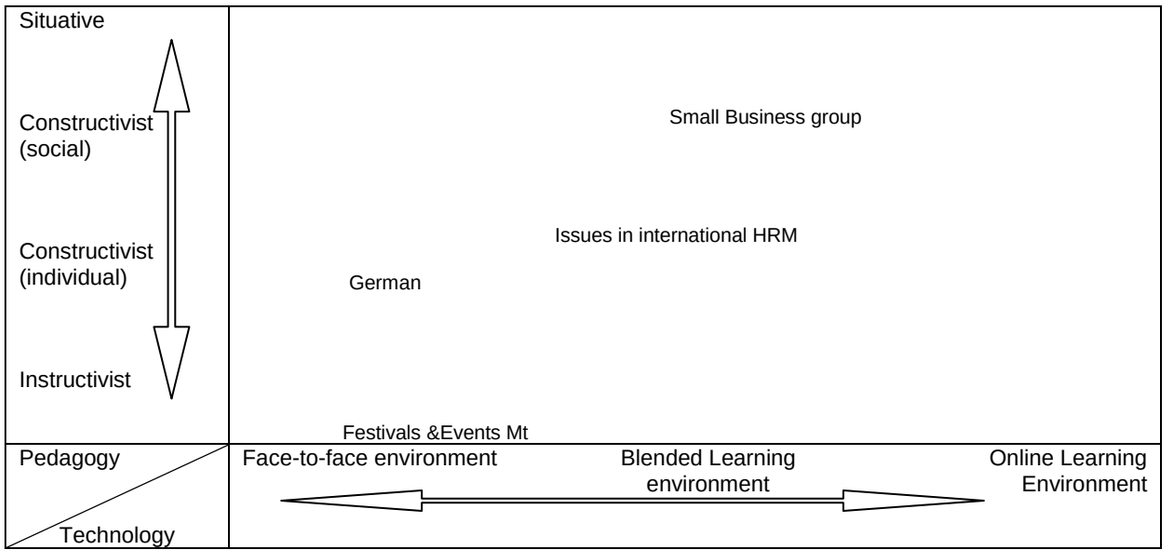



**Figure 6.3.3.1 An International Business Student's pedagogy/technology framework - Dave**

### 6.3.4 A Digital Technology Student's experience

'Martin' joined the University at the start of his second year having begun an extended degree at a local FE College. He came across the invitation to join the diary project while at the FE College and was keen to get involved:

> *'I heard about it and I was thinking that it would be nice to help out pretty much. I wouldn't mind taking part in this research. It seems quite interesting'*

The diary videos had not raised any particular issues for him as he already had some idea of the extensive time he was spending with digital technologies.

> *' [it]maybe highlighted the fact that I use technology a bit too much. I'm sure I knew everything that was there by myself I think.'*

He had been involved with technology since early days at secondary school so he had relied on using digital technologies for much of his learning:

> *'I always spend time with technology obviously, that's pretty much all I know.'*

The dominance of technology in his life extended to the way he had learnt using online support whenever possible.

> *'…to learn I do use technology. I hardly use books or paper like the old school methods to do stuff. Most...technology, it's just an easy way of doing things for me really. It's just simple.'*

The lecturing style he preferred was a didactic one with plenty of examples, for instance where the lecturer worked through a piece of software with the students in class so that they were keeping up and doing a practical activity at the same time as listening to the explanation. He stated that his preference up to this year was to work through material on his own rather than with a group of other students and in this respect he presented a sharp contrast to the study preferences of Ellen, Dave and Hannah. In conversation he shared that

for the first time he was trying out revising with another student and benefitting from the shared working through of lecture notes and practicals.

In his Venn diagram Martin predictably identified the strong affinity with using technology in his learning and in his everyday life that he had spoken about.

> *'Even when I'm with my friends we're using technology, either watching a DVD, going on the internet or we're playing games. Technology is everywhere. I don't think anyone can escape it.'*

He had one of the highest locations of his blue study circle over the personal and technology circles to represent the role that technology played in his life.

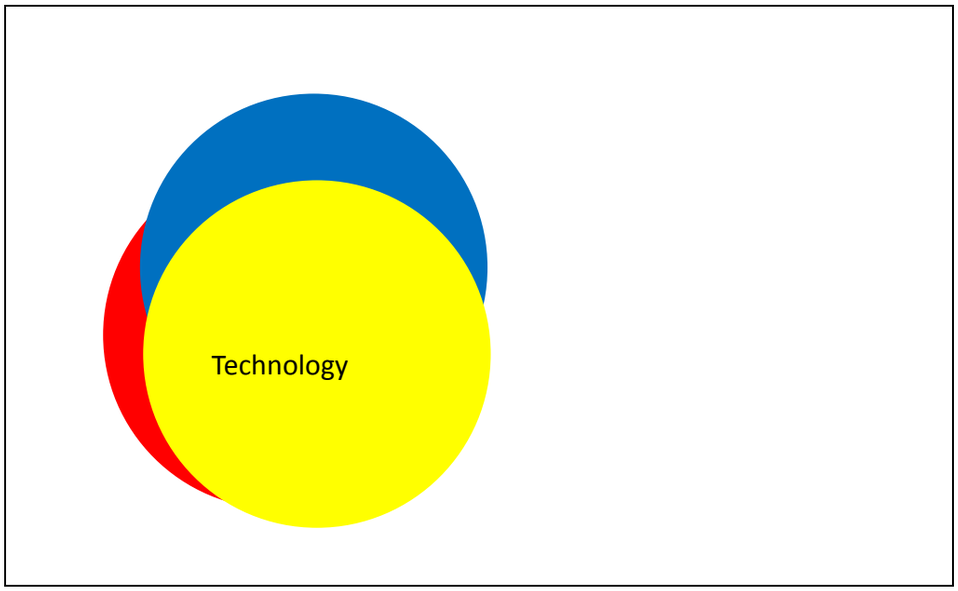



**Figure 6.3.4 A Digital Technology Student's experience - Martin**

Martin also described in detail and with obvious enthusiasm how his DBE lecturer used a blended approach in his classes:

> *'DBE, the Digital Business and Entrepreneurship, that's definitely blended learning because what he covers in the lectures is actually sometimes not enough because he has a lot of information to give in such a short time, two hours which turns out not to be a very long time and delivering his type of presentation. So … he has links on the*

*presentations which he gets from StudyNet and you can actually click them and they'll send you to a page that elaborates on whatever the part he was talking about in the slides or in the lecture. So he does that for all his work, pretty much and he has a load of documents like Word documents and PDF documents covering other pieces of technology that he wants us to expand our learning on… he wants us to get into the mode of reading and researching and expanding on our knowledge… It gives you energy to go and do the researching stuff. So he's definitely on the blended learning.'*

In his framework (see Figure 6.3.4.1 below) Martin's learning has been spread out across the continuum from face-to-face to blended learning. He started with his modules grouped across the left–hand side and then drew arrows onto his hand drawn model (see Appendix 7, ii) to show them located in the blended column to reflect the high technology content. His preference has been for an individual constructivist approach as by his own admission he preferred to work things out for himself. He admitted that this year he had worked with another student to revise and study together as the exams approached and that this had supported him more than in the past when he had tried working with others voluntarily, because the pair were well matched in ability.

For all the use of technology that he had in his day-to-day and study lives Martin was not however keen on a purely online study environment. He described himself as a 'visual learner' and spoke warmly of his contact with lecturers throughout his programme. While a thoroughly competent technician he wanted a blended approach to his learning. For him it was very clearly a case of 'both/and' in terms of having a learning environment which was both face-to-face and online and which offered a variety of pedagogical approaches for him.

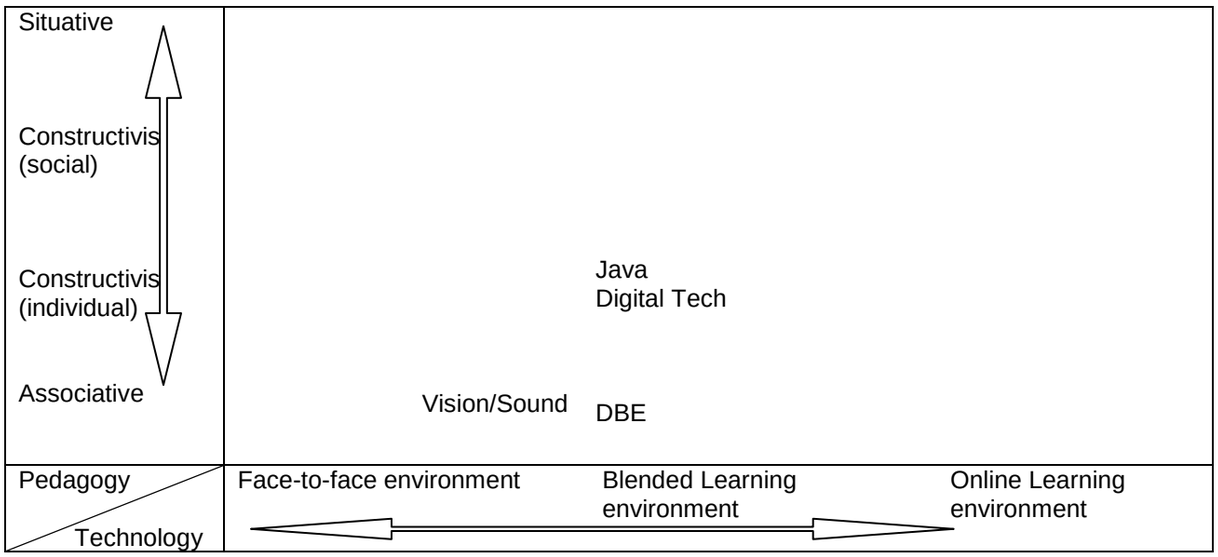



**Figure 6.3.4.1 A Digital Technology student's pedagogy/technology framework - Martin**

### 6.3.5 A Midwifery Student's experience

'Rebecca' was a student on the midwifery degree, one of the smaller programmes in the large Health and Human Sciences Faculty. Her interest in joining the diary group was from the point of view of seeing her own programme's students represented:

> *'…mainly to see whether midwifery was represented because it is often not, within the university, as we are such a small course, there are only 25 people on my course, so compared to some of the other university courses, we are quite small.'*

The midwifery students' group for her year was composed of a larger than average intake of mature students and was entirely female.

> *'…a lot of the girls on my course are mature students so there are probably more mature students than there are at the younger end.'*

She reflected that the style of teaching and her own style of learning were little different from what she had used at school with much use of *'pen and paper'*:

> *'… because it is such a practical kind of, hands on course, there are not really any additional kind of bits and pieces [of technology] that you need.'*

From her point of view there had been little apparent change in her way of studying. Her participation in the video diaries had shown her that:

> *'it just made me a bit more aware of it [technology], but I do learn in a particular way but that was helpful and it has kind of encouraged me that actually I have got this far and it has worked so far, so why change it?'*

The content of the curriculum as with many healthcare programmes which lead to membership of a professional body is clearly prescribed by the regulatory body, in this case the Nursing and Midwifery Council. The style of teaching and the associated technology

support are not however laid down in detail so the experiences of students from different universities may show variation.

Reflecting on the different nature of the healthcare courses from the other programmes such as humanities or technical subjects, there was far less use of technology in the mode of delivery for midwifery and in the way that students were expected to use it outside their classes. The use of educational technologies and the encouragement to students to engage online showed clear differences across the teaching approaches in the nursing, radiography, physiotherapy departments. For example the use of podcasting and of electronic voting systems has been widely used across other programmes such as radiography but there was no evidence from Rebecca's experience of these technologies being used in Midwifery to support student learning.

StudyNet, as an MLE, was used far more as an information repository for material, such as the lecture notes which formed the basis of the teaching especially in year one. It was not used at all for its Web 2.0 collaborative learning tools, such as wikis or blogs.

> *'They (the lecturers) used StudyNet for kind of uploading lecture notes and that kind of thing but it didn't go much beyond that so we were encouraged to access that before our lecture but we had to print them off to attend the lecture so that you could make notes.'*

The classroom design for the midwives did not lend itself to them using laptops even if they had wanted to: '*The classrooms that we often ended up in had really skinny desks …you would turn up with your bag and pen, and there is not quite enough room'.*

When the quantity of material the students were required to learn and the prior study habits of typical cohort of students were combined, the end result meant that a *status quo* which offered minimal online support was retained*:*

*'it was so much to cover and because a lot of the mature students like writing stuff down rather than typing notes, and that was the way that I learnt at school you know because we didn't have laptops in lessons. When I go home I print the notes off anyway, you know. Very few would actually bring their laptops in, so the lecturers kind of just went with what the students came with.'*

While some social networking went on outside the classroom and Rebecca used Facebook to keep up with friends both on the course and elsewhere, there was no use of it for their studies:

*'actually Facebook is quite revolutionary [for some of the older students]!'*

Rebecca's experience of the use of technology to support learning was definitely the least of all the students in this study. She described herself as a competent user of technologies but they were not generally used by her teachers and the strong prescribed content of the curriculum meant that there was little time to experiment with other uses. From a classroom point of view: *'It was PowerPoint™ and that was it!'*

When she was asked if the lecturers' use of PowerPoint™ could in any way be described as blended learning, for example from Martin's description of embedded links to video and other online materials, she was emphatic:

*'No. Because in fact what they could have done was stand there with an overhead projector!'*

She did mention the use of StudyNet for some group work projects, notably for the inter-disciplinary studies with other healthcare students. There was some growth through the three years of her course towards a problem–based learning scenario, where materials could be sought out online. The influence of the greater use of technology to support learning by some of the other healthcare programmes' was shown in the incorporation of more technology related assessments for the inter-disciplinary courses:

*'…the multi disciplinary [module] was heavily technology based and you had to use StudyNet to communicate or you failed the module and all your submissions.'*

She described how the pedagogy of her course had shown a progression from a strong focus on teacher-directed learning in her first year to an encouragement of independent styles of learning and the forming of professional opinion in the final year. This was also influenced in her opinion by the prior experience of technology and of pedagogy of other members of the cohort.

*'…a lot of the girls on my course joined as adult learners perhaps from access courses, so the last time that they studied was quite a number of years ago. The first year needed to be quite regimented and 'this is the information that you get and this is what I expect' all the way through and then they kind of give you more free rein and by the third year it was 'do it yourself' and so I think it had to be that way.'*

With a high volume of core material to learn Rebecca reflected that having the content explained in *'black and white'* by the lecturer was important to provide the basis for her learning, although she and her fellow students enjoyed the group work style of learning.

*'what is plain through …our kind of our training is that we all found that we benefited from doing kind of community interactive group work but there wasn't the time to facilitate it, because some of the learning was so complex. As much as we enjoyed group work, it was much more beneficial to have a lecturer talk us through every step of the way so that we knew we had it right at one point and then go off and do group work. So we did it in our personal time and worked it through and just did discovery learning and worked out different bits and pieces but in that initial stage we needed it down in black and white by a lecturer.'*

Rebecca's Venn diagram (Figure 6.3.5) was an exception from this group of interviewees with regard to the comparatively small amount of technology which she included both for study and on a personal basis. It could be argued that while she was a student, there was a high content of essential material to learn and so she had little time for including her

personal use of technologies day by day. Her learning style was quite different from, for example, Dave's style of working where he described how he would multi-task and dip in and out of his social use of technology alongside his course-based work throughout the day when he was online. It was also different from Ellen and Hannah's because of the small amount of technology that she encountered day by day.

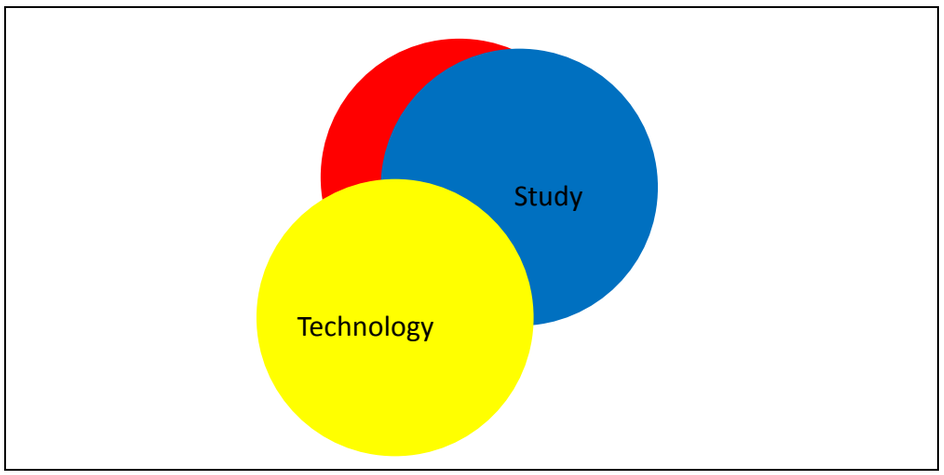



**Figure 6.3.5 A Midwifery Student's experience - Rebecca**

The circles here show only moderate amounts of technology used for study and private use and the relatively high degree of her time spent on studying (the overlap between the blue ad red circles). She probably recorded the highest amount of time spent studying overall.

In the discussions on the use of her personal pedagogy/technology framework, (see Figure 6.3.5.1 below) Rebecca reflected that in her final year of study the lecturers had incorporated a much greater level of group work which the students had benefitted from. There was still only a small quantity of *'real blended learning'* for her studies. Here technology is being used as a tool alongside a reliance on paper and pen for taking copious notes.

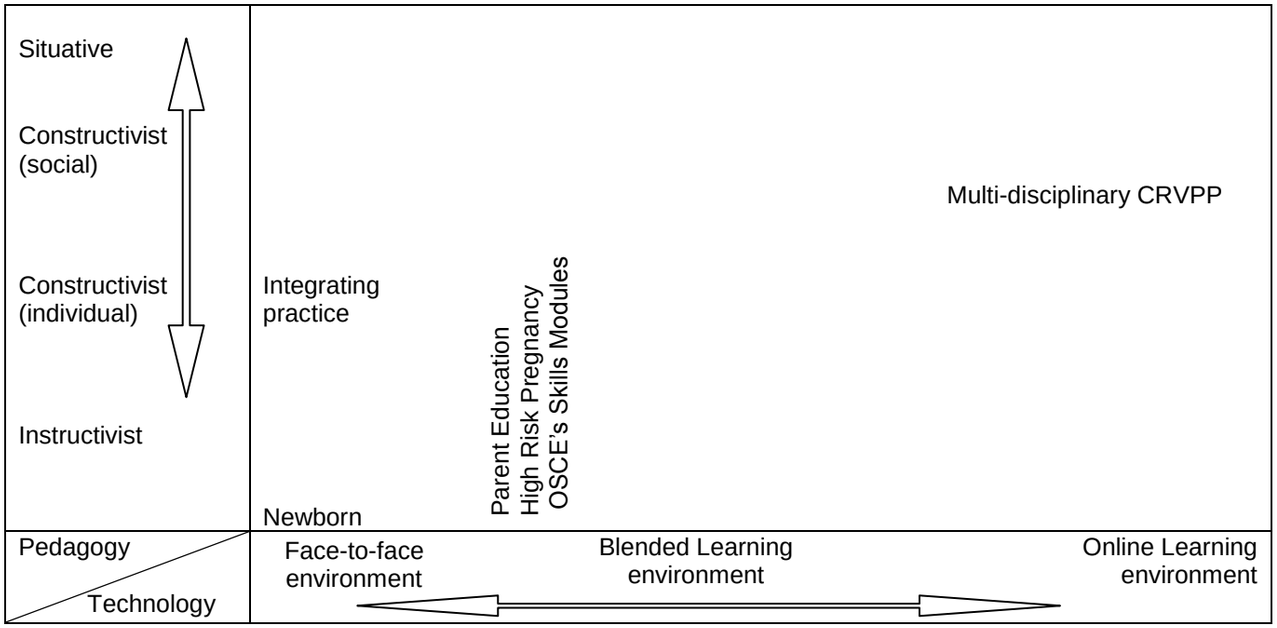



**Figure 6.3.5.1 A Midwifery Student's pedagogy/technology framework**

The pedagogic style of being heavily teacher-directed or instructivist in the early years to a more collaborative style of learning which used groupwork alongside the development of independent learners has been mentioned above. One of the problems which has therefore been highlighted through Rebecca's story in the use of this framework is that in the current design it can only offer a snapshot at a particular moment in time of that student's learning experiences, from the pedagogical point of view as well as from the technology view.

### 6.3.6 A Business Studies Student's experience

'Nick' was enrolled on a four year Business Studies degree at the University of Hertfordshire. He spent his third year on an industrial placement and like Dave and Hannah brought to the interview stage a wider understanding of how his learning and technology use fitted in with his overall view of what the university provided. He was interviewed at the end of his placement year just before he started his final year at the university; however his experiences of using technology to support his learning are interesting. They emphasise the importance of technology in every part of his life and the way he reflects on his use of technology in general, as being symptomatic of belonging to his own generation as he left school and progressed to university.

Nick volunteered for the diaries because:

> *'It sounded a kind of interesting project and it's quite a good thing to get involved in while you're at university [to] help out on a research project'*

In terms of the changes which keeping the diaries had shown him, he also picked up on the extent to which he was using technology in his everyday life, which he had not previously realised.

> *'I think it shows how much you rely on technology because … a lot of the time you don't really separate it out… By actually sitting there and recording that we use technology to do this, this and this which you never really separate out [at other times].*

He reflected on his use of technology as he was growing up and how it was a 'normal' part of his life growing up through school so that the transition to studying at university did not present any problems:

> *'It's kind of new technology you pick up along the way …but growing up in the generation they do at school it's just adapting to the new technology. It's not really*

*necessarily having to …learn **how to use it** [my use of bold]. StudyNet's quite an easy system to get around especially if you're used to dealing with computers and technology as you grow up.'*

His transition to university and progression as a Business Studies student was carefully reflected on, as through his transition from school-based learning to HE, he developed his own independent learning style. This experience contrasts with Rebecca's story of a more regimented approach to the curriculum and to learning, where the students were not expected to use StudyNet beyond a repository for materials.

*'I think when you start there's more reliance on you doing your own research [than at school] and where you look for it is a lot bigger(sic) than where you've been in previous education. Across the two years at university I don't think it changes a great deal because what you start doing in your first year to where you end up at the end of your second year is quite similar. You're just more used to going off and finding journals, maybe using Athens and things like that.*

He was already a competent user of learning technologies and familiar with doing personal research online.

*'There's some new things added along the way [like the wiki for my year two module] but in the case like finding out journals and using the Athens thing to [research] and submitting work via StudyNet stays the same over your years at university.'*

The lecturers' use of StudyNet was varied; while some academics used the opportunity to load up podcasts of their classes or narrated PowerPoint™ materials or set up collaborative learning through the use of a wiki for his 'Business for Economics' module, the rest would use it as a repository for digital lecture notes:

*'I think the majority of lecturers would use it as a way of storing files and making it accessible to you.'*

There is therefore a potential difference here in attitudes to the use of technology between the point of view of the undergraduate students, who are typically as in Nick's example competent and confident users of ubiquitous technologies and their lecturers who may be less willing to engage with using technology to support the students' learning. This is seen when Nick's Venn diagram (Figure 6.3.6) is compared with his description of the pedagogy and technology used for his framework (Figure 6.3.6.1). In Figure 6.3.6 Nick's Venn diagram shows a close engagement with technology in every part of his life both study and personal. The overlap between the student and technology is not quite as extreme as it was for Hannah, Ellen, Martin and Dave but it identifies the very significant role played by technology in his personal and to a lesser degree his study life.

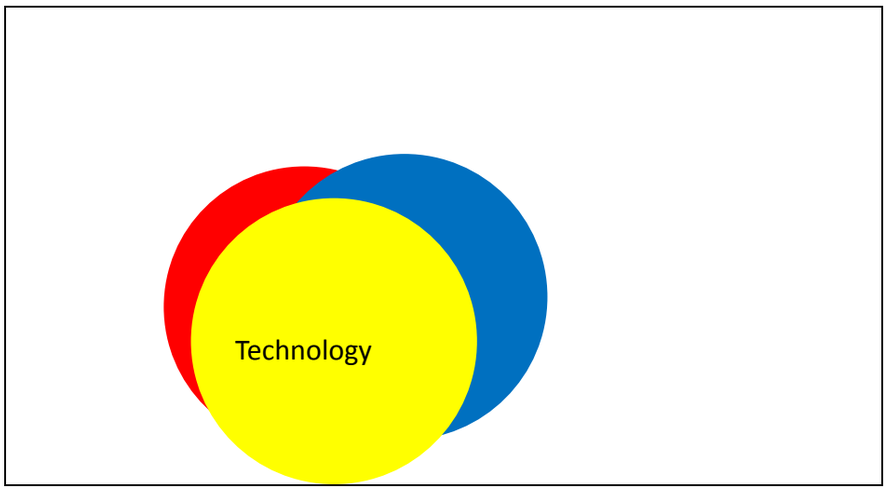



**Figure 6.3.6 A Business Studies Student's experience – Nick**

In his framework Nick commented that much of the online element was his own researching for additional materials for his assignments, the teaching had been by and large via an instructivist approach. He reflected on his preference for working things out on his own as being more beneficial for his own learning:

*'I think the opportunity to go away and explore for yourself the subject … for me anyway, that is more likely to sit in my mind for longer rather than the kind of teacher directed because often that's a kind of two way process,…you can explore it and therefore by doing that you've got an action that fits to the kind of content that you've learnt, and fit it more in your mind and therefore I lean more to that [way of learning]…'*

However from a pragmatic point of view he still expressed a reliance on receiving the information in the lecture to ensure he was getting the full picture:

*'…you've got the lecture, so you're confident that you're not missing anything but then you can go and do an assignment to explore your interest in that subject as well, but yeah, the only thing with those areas is if you're not getting enough information off your lecturer you might think that you'll go to an exam and you can miss something and I guess it's striking that balance isn't it that you've covered everything yourself.'*

And the lecture was the foundation from which the engagement with the learning was based for most of his modules:

*'In Business Studies you're not required to turn up at any point but the basis of the modules it's still that kind of lecture and seminar.'*

He was quite comfortable with this approach since:

*'You know that you're learning the necessary core aspects of the course and you're meeting face-to-face with the people that you are going to be expected to work with in a group.'*

The exception to that point had been the wiki based learning for Business and Economics where: '*you wouldn't be able to pass the module without participating within the blended learning approach'.*

Nick's experience had therefore been one of an apparent divide between the formal learning delivered by many of his lecturers and which the students needed to attend to gain

the basics, as against his and his peers' easy and independent use of personal and university provided technologies to support their learning through their online research. He recorded that he would use technology out and about personally, for example with his iPod, and echoing comments made by Ellen and Hannah he said:

'*It's just amazing how much technology impacts your life without you realising, really*.'

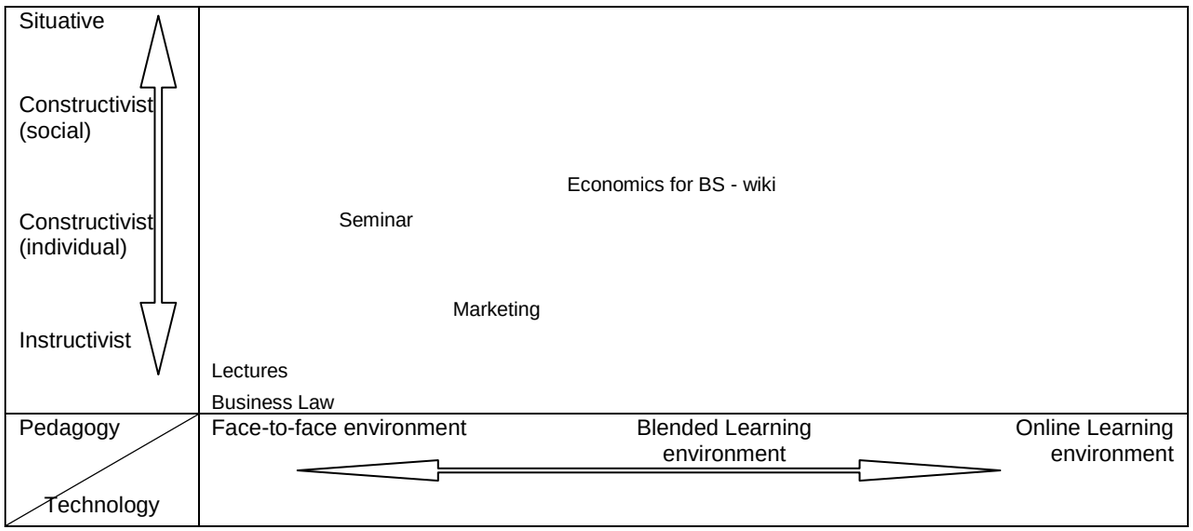



**Figure 6.3.6.1. A Business Studies Student's Pedagogy/Technology framework - Nick**

### 6.3.7 An English Student's experience

'Kristin' studied English at the University of Hertfordshire. She enrolled onto the course straight from school and reflected particularly in her diary and interview on the differences between being told what to learn at school and her growing independent study habits at university. In a similar way to the other students she took the use of technology to support her learning for granted. She had been using a word processor for typing up her essays before she started her B.A and was familiar with searching for material online. She described the difference between university and school in terms of searching for information and developing as an independent learner:

> *'It's quite a surprise when they tell you just go and do it all yourself, whereas at school they already know what you're going to find…at school it's definitely not as independent. So they tell you what to go and find, rather than us using it here to find what we want.'*

Kristin volunteered for a diary because of the perceived difference between her own attitude to her subject and to technology:

> *'I find it quite interesting coming from Humanities to talk about technologies because I associate technology with science and maths and computer science kind of learning. So I thought I'd volunteer and try and work out how I actually do use technology, because for us [learning's] more very much kind of reading a book and writing an essay.'*

She described the way her lecturers were engaging in diverse ways on StudyNet to use online technologies to support the students' learning:

> *'…they had folders for each of the books that we studied and they put up links to articles that they'd read or things that they wanted us to read. If it was an extract they'd leave that on StudyNet so you could just download and print the extract and*

*then for at least two of the modules this semester we were doing discussion forums and for one of them the entire grade of the module was based on a wiki blog.'*

As had been revealed by some of the other students she realized that she was using technology in her learning to a greater extent than she had thought previously:

*'It (the diaries) made me point out where I use technology and it was more often than I had thought, if you take into account the resources, even using the internet.'*

She also discussed how she would use strategic searches for material in a similar way to Ellen's strategies, tying this in her mind with a growing maturity in her approach to learning through her second and final years.

*'…if I was writing an essay on a certain topic I'd go and search the journal databases for that topic or that author and find things that related to that and use them rather than finding a generic text book … I think it's when you get to final year and then you start properly working.'*

There were two main benefits for Kristin in using the internet to support her learning:

*'Well, the main one or the first one that comes to mind is time-saving in a sense, which might not be the most obvious one but if you're using technology to type them [essays], to download journal articles and to email tutors and things it is so much quicker and that if you want a piece of information you can just search it on the internet on a database and it's there, you don't have to trawl through books.'*

The second one was her ability to research and access material that had not previously been available online like her module in North American literature: '*which probably wouldn't have been possible fifteen years ago because we've got access to books online and articles from America.'*

For Kristin, technology had provided some clear benefits for enhancing and opening up the possibilities for her learning. Some of her lecturers appeared to embrace the possibilities for using technologies to learn within the pattern of the classes and when she reflected on the pedagogy there was a clear pattern developing:

> *'So I'd say everything was backed up by technology even if it started out as face-to-face…Our format is lecture-seminar so we get a directed lecture and then in the seminar we have questions or we're given tasks and we talk in groups.'*

This fitted with her own developing independent way of working and of challenging her lecturers:

> *'I think it's independent enough...because you can challenge... you can ask the lecturer questions during and especially in the seminars you can say, 'Well, I think that's not quite right,' and they actually invite that. They don't want to be seen as the authority. They want you to challenge them.'*

For Kristin, as with Martin, there was an enthusiasm to use an approach which blended the face-to-face contact with use of technology as a natural part of her daily learning. The 'both/and' approach mentioned above, which she summarized as: '*I'm quite happy with it [learning]being face-to-face as long as there is technology to back it up.'*

Kristin's circles in her Venn diagram (see Figure 6.3.7 below) show an overall balance with less technology used for learning than other students; she used more technology than Rebecca but there was not the same overlap between the student and the technology as Martin, Dave, Hannah and Ellen showed.

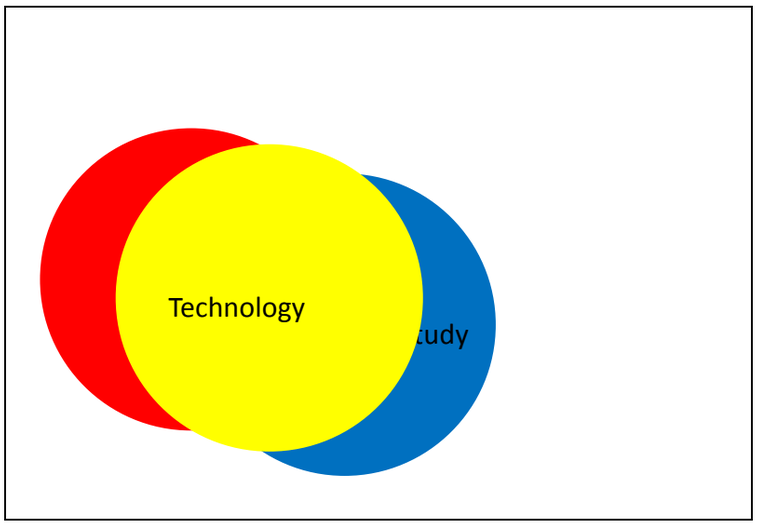



**Figure 6.3.7 An English Student's experience- Kristin**

In her pedagogy and technology framework (see Figure 6.3.7.1 below) Kristin places the lecture and seminar model of learning towards the bottom left hand corner of the framework. She uses the face-to-face and instructivist position for these as the content was largely teacher directed but they overlap into the blended learning area because of the online support they included. One of her project modules had to be completed individually and the other as a collaborative piece of working and these are placed in the individual constructivist segment for blended learning, reflecting her preference for working out her own ideas and using web based materials for deciding her own views before collaborating with others.

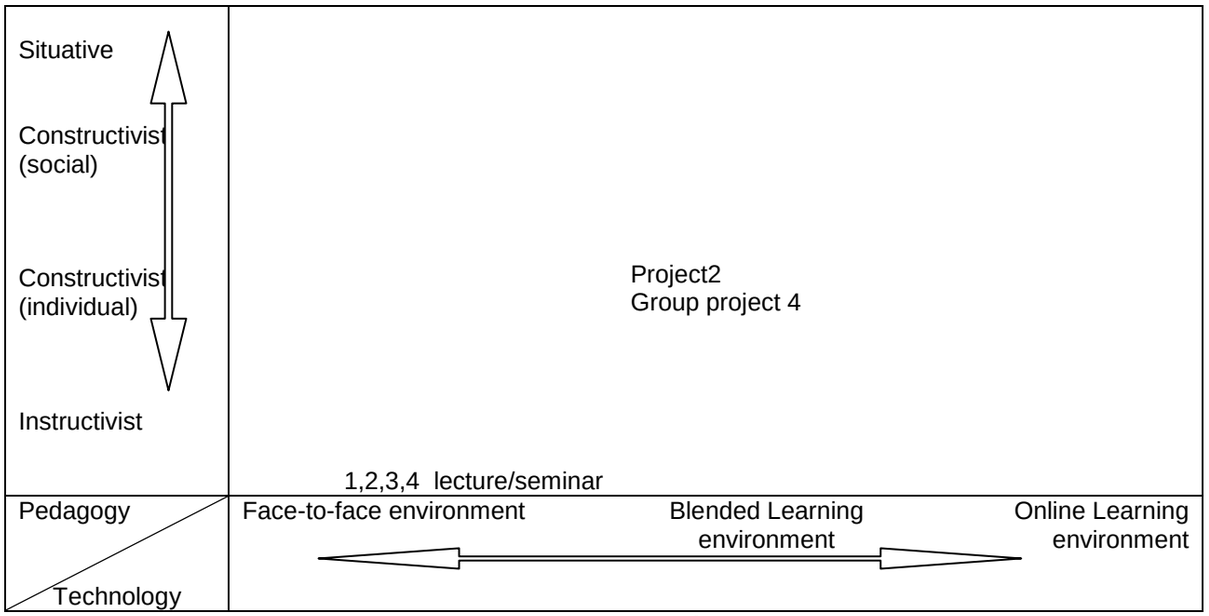



**Figure 6.3.7.1 An English Student's pedagogy/technology framework**

### 6.3.8 An Artificial Intelligence and Psychology Student's experience

'Matt' had chosen an unusual combination of subjects for his combined honours degree: Artificial Intelligence (AI) and Psychology, reflecting his own passionate interest in people and technology and what made them tick. By the time he came for interview he was enrolled on a PGCE for secondary teaching. He had also had experience of studying at another university in the interim so he was able to compare the provision there with what Hertfordshire offered for using technology to enhance learning. He was probably the most self-aware of the students, even within this highly reflective group of interviewees. This was perhaps because he was at least three years older than the youngest by the time of his interview. He was the most openly altruistic of the students in his conversation, demonstrating this through his running of study revisions sessions for the students on his cohort. He was also a self-confessed technical enthusiast, describing himself in Prensky's terms as: '*I'm well and truly a digital native… almost all my life is technology based … It was my own personal interest rather than anything else.'*

He had volunteered for the diaries because his friend 'Dave' had seen the project advertised and also because:

> *'I've always got an interest in teaching and learning anyway being obviously teaching myself. I like learning anyway. I like to throw myself into anything where I can learn something as well as do other things… for me doing this project it was quite introspective for me to be able to re-watch my own diaries and seeing how productive I was being for a start, because I seem to remember a lot of my diaries starting off with 'I didn't do as much as I probably should have done today but...'*

The reflections he made during his diary keeping had a particular effect on his learning style and for him this was quite a life-changing moment as he had to articulate his learning day by day. This crystallised his own thoughts on how he learnt. He had always previously tried to

learn material thoroughly by reading but the diary-keeping showed him how little work he was actually doing:

> *'When I started to realise that actually, especially watching back the diaries and saying to myself: 'I haven't done as much as I should have done today'. 'I was reading and I went and did this instead' I started to realise that's not the way I learn best and...I started shifting towards writing my own essays and writing practice essays and that kind of thing and it made me so much better. I also found that, whether it was through the diaries or not, I'm not sure, but by teaching something I learn a lot easier.'*

Having realised how researching and writing essays helped him to learn and that the next step was to have a mastery of his subject good enough for him to teach others he set up revision sessions for the other students on his course.

> *'We (my housemate and me) used to run revision sessions for the rest of the people in our cohort in our particular strengths. Biological psychology was mine and some of the artificial intelligence stuff and his was social psychology and performance psychology…It was to help everybody else but it helped me so much because to be able to explain it I had to understand it myself.'*

His love of learning and his self-motivation to understand the subjects he was learning became strong drivers to develop a deeper understanding of his subjects. In terms of using technology to enhance his learning he was very selective in his use of StudyNet from the point of view of first working out what he felt he needed from the application. Matt's description of the different areas of StudyNet was more detailed than any of the other students but he used only those areas which supported his learning from having investigated what was in offer. He was an avid user of the online databases via the Athens provision and would log on to these from wherever he was based to access information. Selective and strategic were two adjectives which came to mind immediately to describe his attitude to his learning and to his support for others. But as he admitted in his interview he

only developed this strategy through the second and third years of his undergraduate degree. In his first year he used StudyNet just to print off the notes for the classes he had not attended:

> *'For me it was about finding a learning style which I enjoyed doing and because I enjoyed it I learnt better… for my first year where I barely used StudyNet except for grabbing lecture notes. Then I started to realise at the end of my first year that perhaps maybe I should be doing a bit more work than I was and that's when I started using StudyNet as I do now. I mean I used it before like to print lecture notes off for lectures that I didn't go to … but I started using it a lot more proactively at the start of my second year to do my own kind of reading through Athens and all the materials lecturers had put up.*

Having described his strategy for learning more effectively, Matt then explained his own strategy for managing all the technology with which his life is filled. Claiming that in fact he was not as overtly 'techie' as many others, he said that he chooses which technology he will use to fill a perceived need, before embracing it or rejecting it:

> *'I'm a bit of a sceptic when it comes to new technology actually. I've never been a massive fan of all these new sparkly things which come out. I tend to resist them up until a point where...usually someone persuades me to have a go at it and I'll have a go and I'll either like it or I'll hate it. Twitter was an example. I resisted Twitter since it started and I only signed up about a month ago and hated it and I've not used it since. I'm always quite resistant to the new things when they come out, but only because usually what I have suits me quite well and it's not until I have a new need come through, like the fact that all of a sudden I had six email addresses that I needed to organise, that I started using iGoogle. So usually it's because kind of like a hole appears that needs filling I will pick the technology which suits me better.'*

It came as no surprise to discover that when Matt completed his Venn diagram (Figure 6.3.8) he described it with technology playing a major role in his life. However he did not represent technology as dominating his study life as much as his course of study or his conversation

may have led one to think. This is because by his own admission he also loves physical books and spends a lot of time both reading and debating with his friends face-to-face and enjoys the social side of his studies and life.

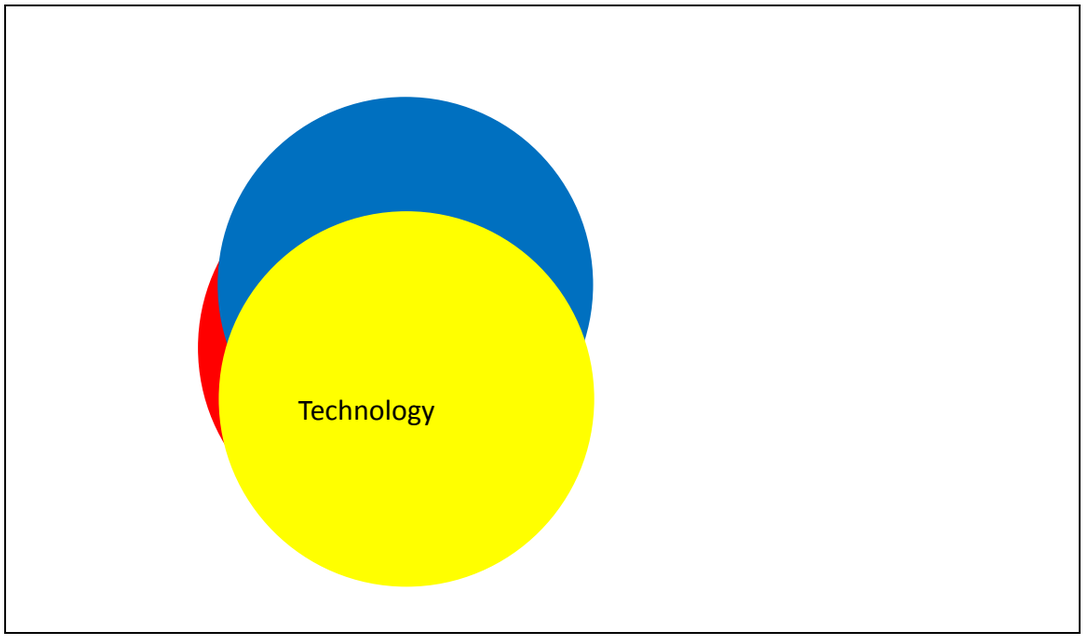



**Figure 6.3.8 An AI and Psychology Student's experience- Matt**

Matt's enthusiasm for learning and knowledge building has been expressed by him as one of the key drivers for his studies and through this he has developed his personal use of technology to enhance his learning. It is therefore not surprising to see a mixture of teaching and learning styles appearing across his personal framework for pedagogy and technology use (see Figure 6.3.8.1 below) and to note the preponderance of blended learning which he includes. He was the most clearly strategic in his description of his own decision-making for accessing technology to support his learning but he also tried to include other interests in his life. Overall however he concluded that even for someone who picked and chose his technology involvement for leisure and study: '*there's very, very little in my life that isn't involved in technology.'*

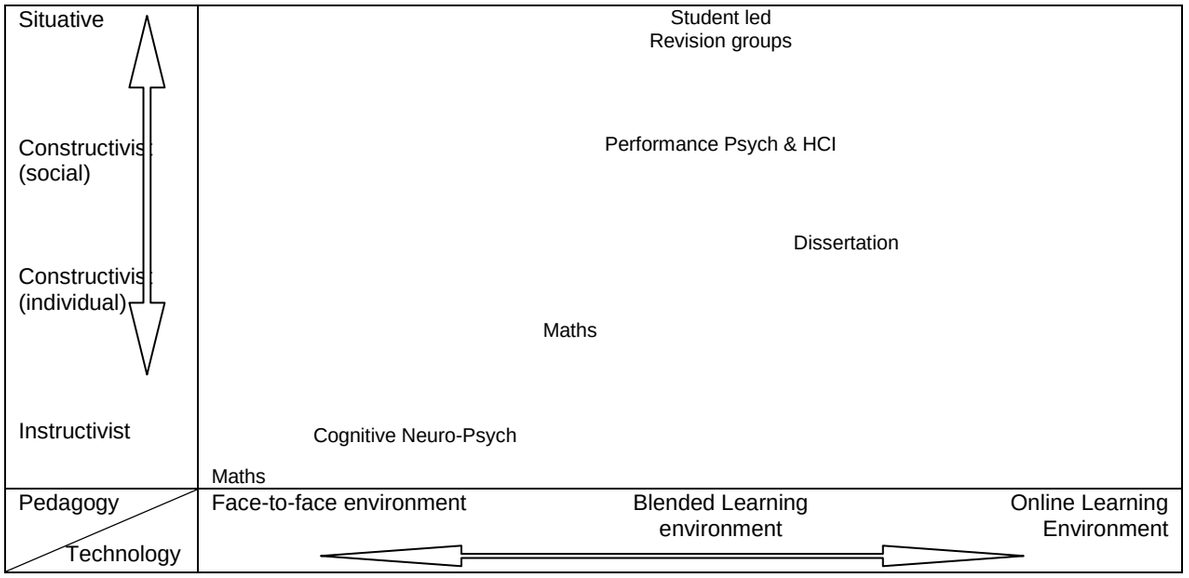



**Figure 6.3.8.1 An AI and Psychology Student's pedagogy/technology framework - Matt**

## 6.4 Discussion and Summary

This chapter has considered in some detail the experiences of the eight interviewees which form the second stage of my research into how students express their blend of learning in their studies and personal lives. Their words offer insight into the multi-faceted experiences of their use of technologies, both personal and institutional, for supporting their learning and into how blended learning has or has not provided underpinning for their studies at university.

The extent to which technology has become an integral part of their lives and its importance in every aspect whether personal, social or studying had surprised many of these students as

they completed their diaries. It was commented on frequently by other students in their diaries as well, as exemplified in this diary quotation,

> *'This week [of doing a diary] has shown me just how much I rely on technology' (Student, 2007)*

The striking point here is that it is almost as if they had been unaware to that point of the growing and yet imperceptible influence of technology throughout their daily lives. Seven of the eight interviewees in stage two have identified a very strong impact of technology in their lives as undergraduates and have described the use of technology as an essential part of their lives for both studying and personal contacts. But the picture is not overwhelmingly technology focused. Some subject groups, as 'Rebecca' related, support the use of online technologies purely as a convenient means of allowing students access to digital versions of their lecture handouts, either because of the preferences of their student body or the academics' choice or both. Students make their choices of what they access online both from the materials made available by lecturing staff and from resources that they search out for themselves. The pattern varies across different programmes of study. It might include as we have seen from these students: slides embedded with links to other material, wikis, podcasts, online discussion groups, collaborative online working and individual online assignments.

The Venn diagrams have provided a powerful visual comment to show the extent to which the students considered technology as part of their study lives and offer a simple way of comparing different students' experiences. The full set is given in Appendix 6 alongside the scanned versions of each of the students' paper diagrams. They are easily explainable to participants and I have found them particularly useful as a means of engaging students in conversation about the overall impact of technology in their lives. The physical manipulation

of the circles by the participant leads to a personal and subjective view of their experience, which is not intended to be fully quantifiable. This is in line with the quotation at the start of Chapter Three from Goodyear and Ellis, *'Experience is a relational concept: … expressing a relationship between a person and a phenomenon,' (2010)*, although I would argue here that the students are expressing their experience subjectively. Nearly all of these students commented on the relatively high use they were making of technologies for learning and leisure which had been previously identified by many of the diarists. I look forward to exploring the use of the Venn diagrams in future research with other groups of learners.

When considering the students' views of the impact of pedagogy and technology on their university experience the picture remains complex. These students are experiencing a wide variation of styles of pedagogy as evidenced in their own frameworks of their studies. While 'constructivism' has been widely viewed as the preferred pedagogy in universities for some years (Garrison and Vaughan, 2007), it appears from these students' comments that many of them experience different styles of pedagogy with some emphasis on a teacher-directed instructivist approach. Some of the students express a preference for a didactic style of information giving, so they can be sure that they 'have all the facts' (Nick and Kristin). However, this is appreciated within the framework of their own access to online materials and in Kristin's case through access to notes and links embedded in the academics' slides. Dave commented on the differences between his experiences in the UK and German HEIs, from experiencing a pedagogy dominated by long teacher-directed lectures, which did not expect the students to engage separately with the material and supported by a roomful of books, compared with the blended learning environment at Hertfordshire which allowed him to blend his own learning between the face-to-face sessions and online materials.

In Figure 6.4 below I provide a composite picture of all the students' choices for their pedagogy/technology frameworks. This does indeed show a leaning towards the left hand side of the learning environment continuum rather than the concentration towards the centre and right of the framework which the emphasis on using technology for learning from the students' Venn diagrams might have suggested.

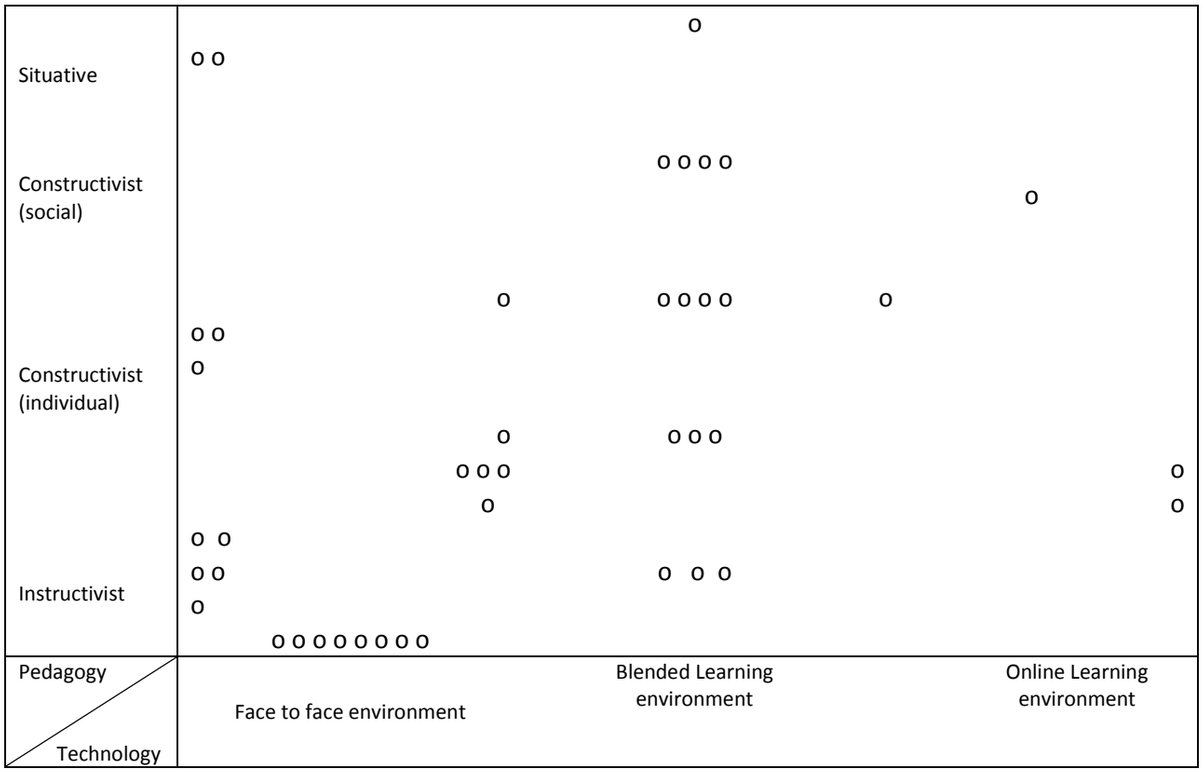



**Figure 6.4 Student modules from the interviews combined on a single pedagogy/technology framework**

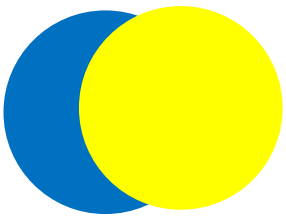
In my research design the Venn diagram and the framework are intended to present complementary views of the student experience of blending technology and face-to-face learning. The Venn diagram allowed the students to present a personal view of their learning through their use of the circles. The framework provided a means for them to identify the points at which they perceived their learning occurring, within the bounds of what was offered by the framework.

On the next three pages the students' Venn diagrams are presented together for comparison. Each figure (6.5, 6.6, 6.7) has one of the circles omitted to offer a different facet of the student' experiences for comparison.

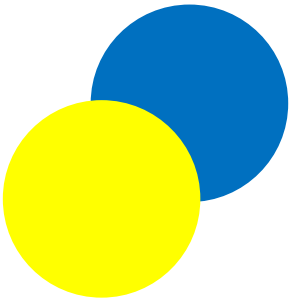
When the blue study circles and yellow technology circles are considered on their own (Figure 6. 5) it is clear that the overlap between the students' use of technology for learning is not as apparently varied as at first it had appeared. Computer Science remains the programme where technology almost completely overlaps with the study in HE circle, as would be expected from a subject where much of the practical work has to be carried out with a computer. Midwifery is again the exception from a generally high use of technology for supporting learning which was noted above in the small amount of technology shown in Figure 6.3.4 by Rebecca. The surprise result in Figure 6.5 is perhaps Philosophy which indicates less apparent use of technology for study than when her blue circle was covered up by the red one. Ellen, as noted above in Figure 6.3.1, saw her life as being 'always connected' as she could not think of a part of her life unaffected by use of technology. She used much of her technology for personal use with a broad overlap between what she used for learning and for leisure. Both Matt (AI and Psychology) and Ellen (Philosophy) had commented on how much reading they did, likewise Kristin (English), but she was also studying material which was only available online and so her Venn diagram looks very similar to those of Martin (Digital Technology) and Matt and Dave, the two students on the Business type programmes when the red circle is removed.

In Figure 6.6 the student and study (red and blue) circles are presented for comparison. Without the yellow circle 'obscuring' the amount of time given for study some comparisons can be made. Here there is a surprise that the Midwife who was the student using the least

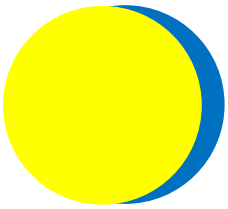
amount of technology does however appear to be spending the most amount of her time studying. It is too late to go back now and ask her whether this is a cause or an effect of her course not offering much access to IT for learning. Would she spend less time studying if there was greater access online to easily downloadable materials designed and chosen to support her learning? Or is the content of the course too practically based for her to spend more time online, which might be seen as wasting time. The Humanities students, (English and Philosophy) and to a lesser extent Business Studies, who all spend a lot of time reading, do in fact record less time spent in study. Finally in Figure 6.7 the blue circle is omitted, revealing the overlap between the student and IT. As already discussed, there is an almost complete overlap between the circles for the Philosophy student. The Computer Scientist and the International Business student are also closely overlapped between IT and the rest of their lives. The Midwifery student's circles show the furthest separation between the student's life and their use of IT



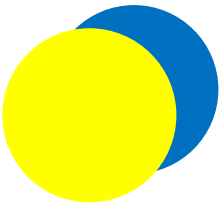
1. Philosophy



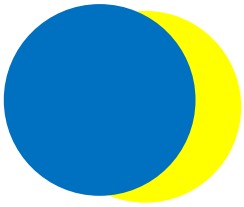
5. Midwifery



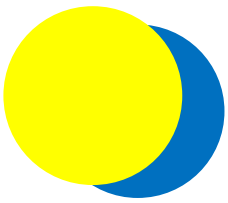
2. Computer Science



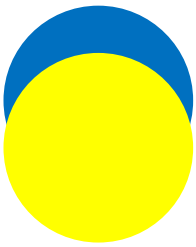
6. Business Studies



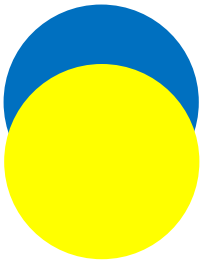
3. International Business



7. English

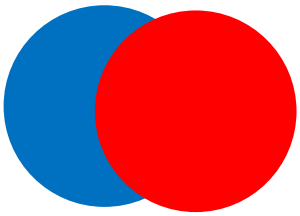


4.Digital Technology

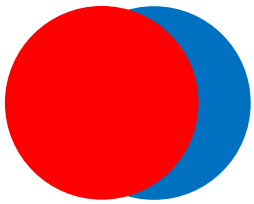


8. AI & Psychology

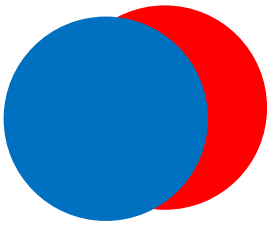
**Figure 6.5 The study and technology circles**



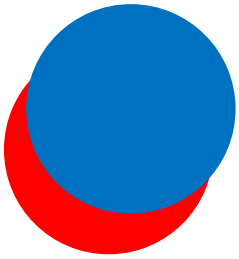
**1. Philosophy**



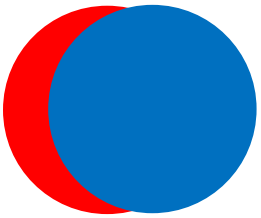
**2. Computer Science**



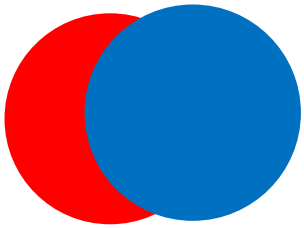
**3. International Business**



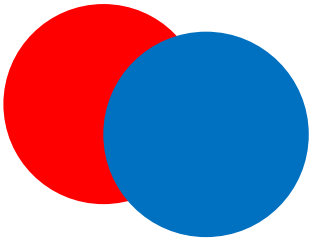
**4. Digital Technology**



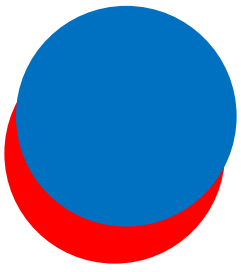
**5. Midwifery**



**6. Business Studies**

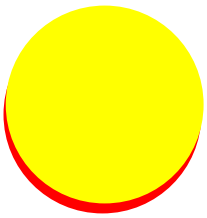


**7. English**

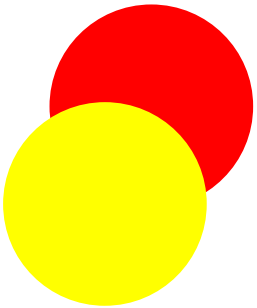


**8. AI and Psychology**

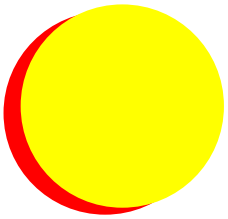
**Figure 6.6 The Student and Study Circles**



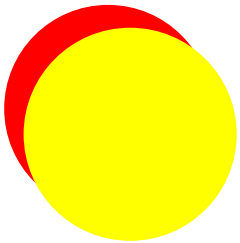
1. Philosophy



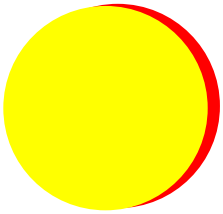
5. Midwifery



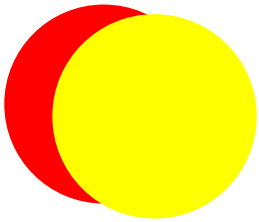
2. Computer Science



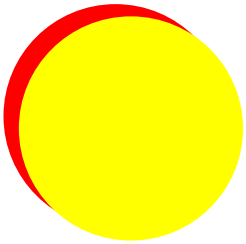
6. Business Studies



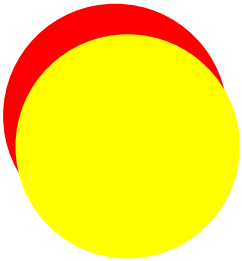
3. International Business



7. English



4. Digital Technology



8. AI and Psychology

**Figure 6.7 The Student and Technology Circles**

## 6.5 Conclusions

All of the students expressed a preference for having a blend between the face-to-face delivery of materials, which they had chosen by enrolling for a campus-based degree programme, and the online availability of materials to enhance their learning. None of these interviewees in spite of their familiarity with technology wanted to conduct their studies exclusively online, because they highly valued the social context in which they were learning. In a recent edition of the Times Higher Education Supplement[26] it was suggested that in the future far more learning may happen solely online because of the cost benefit to students, compared with the predicted high cost of enrolling in the future for a campus- based programme and the extra cost of living away from home for their choice of university. Thirteen years after the influential Dearing report into the use of technology to support e-learning, the preferred model in British culture is still the three year undergraduate Honours degree programme delivered in a face-to-face mode through physical attendance on a university campus.

The pedagogy/technology framework has provided a useful way to open out the discussion with students into how they view their learning experiences and the importance of technology to support their learning across their modules. It offers a focus for exploring the different styles of pedagogy that students have experienced in their HE studies and it also provides a means of determining where technology is used across the continuum from fully face-to-face to fully online. The message from these students indicated that they preferred the 'both/and' blend which combines face-to-face tuition with online access to materials. This blend was evidenced increasingly through their growing maturity as students by the

[26] August 18th 2010

time they were interviewed approaching graduation, as they made independent choices regarding what they accessed online for their studies, The disadvantage of using the framework to my mind has been that it only provides a snapshot at a point in time rather than being able to track the growth of blended learning across a student's experience. This could require a multiple matrix of frameworks to track progression similar to the work of Hans Rosling (2010) in a micro-context. Both Ellen and Nick commented in detail on their changing study habits between their first year and their final year with an increase in personal decision making about what they wanted to access and how they had developed personal search strategies.

In my final chapter I review the answers to the research questions set out in Chapter One and consider the interleaving themes of my research and where the next steps for this will lie.

The contribution to knowledge from this chapter is that students develop their own skills in using technology to enhance their learning in many and diverse ways. From this group of interviewees approaching graduation there has been frequent comment on their growing independence as learners and their confidence in making choices about how and where to find materials to support their learning online.

# Chapter 7: Blended Learning research and future practice

*'I think blended learning will never go away...and for some courses, some contexts, a blend which is 90% conventional and 10% digital is probably right and you'd get the reverse for other kinds of course. So it's entirely up to the particular context what kind of blend you have and we've just got to get practiced at being able to find the right blend for the right course and context.'*

*Prof. Laurillard, Chair of Learning with Digital technologies, London Knowledge Lab, (JISC, 2009: 44)*

## 7.0 Introduction

Laurillard's comment above on the future for blended learning sets the context for the conclusions of my thesis. Her words neatly summarise the blended learning experiences of the students, where I identified a variety of contexts and uses of blended learning in their studies.

The background to this study has been that of an institution committed to a blended learning approach (Bullen, 2005) with pervasive access to technology across its campuses (via both fixed and wireless connections) through its online study environment, StudyNet. In this chapter I return to the research questions which I laid out in Chapter One; I consider what the overall experiences of the undergraduates in this research have shown and the relationship between my own research with other work into e-learning and blended learning. The students frequently mentioned their development as 'independent learners', which was a phrase they had heard elsewhere as it was not discussed explicitly in either the diaries or the interviews. In Section 7.2 I review the basis for their description of

independent learning with reference to Sharpe and Beetham's pyramid model for e-learning, previously considered in Chapter 4, and examine the importance of students' reliance on technology for supporting their perceived independence as learners as they graduate .

In discussing the contribution to practice that my research has made, I consider the role of pedagogy in blended learning and review the discussion about e-pedagogies, suggesting where the pedagogy for blended learning lies.

## 7.1 My research questions and findings

I started this research with three questions about blended learning at the University of Hertfordshire:

- How do students use technology to support their learning at the University of Hertfordshire?
- What is their experience of blended learning as students on a campus-based programme?
- What is the student experience of pedagogy at a 'blended learning' university?

In answering them I have used three overarching themes: the student, their study in HE and their use of technology. The answers are summarised below with a fuller discussion under 7.3.1:

- Students use technology in diverse and complex ways to support their learning at the University of Hertfordshire, displaying changing styles of engaging with technology as their subject knowledge and digital competence grow.

- These students' experience of blended learning is reported as generally positive and complementary to their lecture-based studies. There has been widespread praise for the accessibility of StudyNet and the ease with which they can reach other materials online for researching their studies. The blend they experience varies according to their programme of study.
- The student experience of pedagogy at the University of Hertfordshire shows variety and general satisfaction. There has been, from my viewpoint as the researcher, a greater than expected perception by the students that they are taught via an 'instructivist' approach which relies strongly on being teacher-directed. The experience of constructivist approaches to pedagogy whether social or individual, as recommended by Garrison and Vaughan was not as widespread and pervasive as I had anticipated it might be prior to the student interviews.

I have drawn up below a set of ten broad outcomes from the research in order to inform current and future practice as a summary of the experiences of the students from both the preliminary diary study and the interviews. These students:

1. Use technology as a ubiquitous part of their lives, regardless of their programme of study and the use made by their lecturers of technology; they speak about being 'always connected'.
2. Use technology as a tool to enable them to lead complex lives which combine their many connections through study, work, friends and family.
3. Have a high social use of technology e.g. Facebook and texting but often choose to keep this separate from the technologies they use for learning.

4. Indicate that a 'one-size fits all' approach to technology use, does not suit all programmes or all students; even one MLE does not support all since they use different areas as their changing needs and independence require.
5. Reflect through their personal use of technology, the current global convergence of differing technologies. That is, they often move seamlessly from one type of technology, for example mobile phone, to another, for example their laptop, or choose to access their materials in multiple virtual places.
6. May not have sophisticated search strategies on arrival at university because they become impatient, moving on swiftly if they don't find what they are looking for. However, many spoke about a growing personal 'maturity' in using learning technologies and consequently adopt a 'pick and mix' approach, also described by Sharpe and Beetham as '*creative appropriation'*, in order to find supplementary materials as they develop independent study habits.
7. Often appeared inventive in their personal uses of technology for learning, such as using MSN to support absent group members while holding a meeting on StudyNet.
8. Seek additional technology support from friends and family when needed, such as how to download a podcast onto an MP3 player and use formal support provided by the university such as software downloads or the Help desk as necessary.
9. Have clear and different preferences for pedagogic approaches to their studies. They are typically content with a variety of delivery methods which are relevant to their programme. It is the access to StudyNet, which was unifying across the set of students and noted as being very important across all their programmes.
10. Would like academics to become more proficient with the technologies provided by the university such as StudyNet, to support their learning.

## 7.2 Exploring the concept of 'independent learning' and the student use of technology

The phrase 'independent learning' was volunteered by many of the interview participants in this study, as they reflected on how their own use of technology for learning had changed during the period of their studies and had contributed to what they felt was a greater independence in how and what they chose to study. The development of undergraduate students' changing attitudes to, and personal skills in, learning through their three or more years on Higher Education programmes has been the subject of much research into a definition of 'independent learning' at this level (for example: The LearnHigher CETL at Liverpool Hope University, Hall and Conboy's 'Connecting Transitions and Independent Learning: an evaluation of read-write web approaches (CoTIL)',2008 and Biggs, 2003). Other researchers in pre-digital technology studies described the process whereby learners develop a growing independence in their understanding and their studies. These included Moore who described it in terms of 'increased learner responsibility' for their studies, noting that this was 'the characteristic of autonomous learners' (Moore, 1973). Boud, *inter alia* further pursued the concept of autonomy as evidence of a student becoming independent, in his work on student learners (Boud, 1988).

More recently I have found the work of Sharpe and Beetham to be relevant to my understanding of the students who are describing developing independent learning skills in the blended learning environment at Hertfordshire. Their work specifically considered the needs of e-learners and the importance of the growing ubiquity of technology in everyday life. Sharpe and Beetham considered the use of technology and its role in the student life in 'Rethinking Learning in a Digital Age', (2010). Through their research (2010) they developed

their own pyramid model to describe the process of students becoming effective e-learners and developing autonomy in their studies. Through the four levels of their pyramid model (first introduced in Chapter 4) they describe the process from the initial functional access to technology for learning where learners first consider using technologies to support their learning, through to their description of their higher levels, three and four; 'practices' and 'creative appropriation'. The progression to 'the top section of their pyramid' therefore is intended to provide a means of charting the process of increasing student independence as learners, who make informed choices about the technology they will use in different situations. Sharpe and Beetham's description of the highest level of independence in e-learning described by them as 'creative appropriation' of technology has been evidenced here both in the diary material reported in Chapter Five and in the student interviews in Chapter Six.

Both the diary compilers (see Tables 17 and 18 in Chapter 5) and the interviewees volunteered ways in which they had become more independent in the way they planned and undertook their studies. In the interviews the students described how they made independent choices in their learning which were clearly facilitated by easy access to technology. As they reflected at the end of their studies most of them described making personal choices in how they sought out supplementary materials and in some cases in their final year they were required to write extensive essays (English, Philosophy, and Business) which they needed to research independently online. These exemplify the expectations of Sharpe and Beetham's fourth level of creative appropriation. In the examples below from the interviewees, their own descriptions of relative independence in using technology to enhance their learning are explored.

The ‘Midwife’ described how she proceeded from a point where the original teaching she received in her first two years was highly directive and focussed almost exclusively on the tutor-provided written material, to a later point in her final year when there was far greater encouragement for developing independent skills such as personal research projects. She developed her own skills in seeking out material on the internet as well as asking her friends on other modules for technical help if needed.

The ‘Philosopher’ described how she used technology very casually in her first year without realising or caring about the possibilities of using digital opportunities to support her learning. She became more focussed in subsequent years on using different technologies such as podcasts and online journals to enhance her learning. In her final year as she approached finals and wrote major essays she described in the interview how her use of the internet had become highly strategic. This offers a clear example of a student moving through the levels of Sharpe and Beetham’s pyramid to a point of self-efficacy regarding the choices she made in her use of technology to support learning. This was not because she had been taught specifically how to search for information. She commented that she ‘discovered’ how she could access journals remotely at home in her second year instead of having to come in and use a university computer or internet connection.

The International Business student, who was used to researching widely for material online by the end of his second year of study, described his frustration at having to change his preferred personal style of learning when he was confronted with the limited online facilities which were available to him when he was studying in Germany. The reliance on taught lecture material and lack of online resources for students approaching graduation surprised him when he compared this with his stated and preferred independent style of

working at UH, which was less directive, more collaborative (as noted by Biggs, 2003) and demonstrated the creative appropriation of what he needed to supply his learning needs.

The Graphic Technology student, Martin spoke warmly about how he would follow up the links provided by his lecturer and then pursue his personal interests from this starting point. How far he went in researching the material was up to him and his studies became increasingly less teacher-directed the more he pursued his own independent interests.

The AI and Psychology student, 'Matt' was probably the most reflective of the students interviewed. He set out to develop a new personal strategy for learning when he realised that his original strategy of reading and memorising notes was not working. This showed what appeared to the researcher to be a surprising independence of mind, because of his relative youth and his subsequent clear description of his decision-making processes where his learning was concerned. He learnt from the original diary process that he was not managing his time well and decided he was not really studying effectively. He therefore set about finding the means and motivation to change and determine what style of learning suited him best. In his interview he described how he wrote essays to ensure his understanding and thus researched the topics (online) in greater detail. Later he used technology to manage the amount of information coming in to his life, such as setting up multiple emails from different areas of his life which all came into a single mailbox but labelled according to source.

The point in all of these examples from the students is that within the blended learning environment they were developing their autonomy and self-efficacy by choosing to use technology in various ways to facilitate their growing independence as learners. They are the epitome of Sharpe and Beetham's type of an 'effective e-learner'. In earlier decades,

which Laurillard described as the "*'ICT-free' past*" (Laurillard's foreword in Sharpe and Beetham, 2007), the opportunity for using technology did not impact the students' choice of additional self-study materials, now the libraries in HEI are full of PCs and so the students' choice of and access to journals and other materials may well be more frequent electronically than physically. Without technology their work would have been highly dependent on the availability of physical resources in the university library. With technology they could choose to access a virtual world of resources from wherever they were studying. Access to the internet has however required the students to develop personal strategies in deciding what to look for and how to sift the results of their searches. The student therefore has to now make decisions about which links to follow and to develop their own strategies for success, otherwise they would be overwhelmed with the information overload.

There is an inevitable greater reliance on digital technology for providing the necessary resources to foster this growing independence of effective learners in the current digital age. Independent learning within a blended learning context requires both the technical ability to access material online, which many students arrive at university having already acquired and also the important skill of developing their own personal strategies for discerning and choosing the most appropriate materials for their own study goals.

## 7.3 Discussion of the findings for blended learning and pedagogy

All the interviewees stated that they preferred a blended approach to their studies where technology was used to supplement the face-to-face classroom experience. All the diarists, whether they stated it explicitly or not, were accessing their materials online. The students' description of their ownership of multiple items of technology and its consequent ubiquity in their personal and non-study lives means that technology involved most aspects of their

lives including their studying. This was true for the older students in the diary study as well as for those aged 18 at the start of their programme. To ignore the presence of technology in their studying would be not just 'counter-cultural' for the majority of them but require a complete change of approach in a personal life that is apparently pervaded by technology. In addition to the obvious word processing of documents which many of them have been doing since school days, it is clear that some students may not use a pen and paper for note-taking and the only time they spend writing significantly is in an exam. A recent summary of the benefits of online materials commissioned by JISC and available online pointed out that the problem lies with institutional priorities not with the students:

> *'The benefits to students, provided by well-run e-learning in modules seem undeniable. The problem will not be uptake by students but imaginative use of the facilities available by tutors and institutions.' (Whalley, 2010)*

The students' strongly asserted preferences for a blended approach and the choices of pedagogic approach in their diagrams indicated that they wanted a study environment where face-to-face engagement with their teachers and fellow students was highly valued. This view of student opinion has been borne out by studies such as Hardy's with Edinburgh students (Hardy et al., 2008) and Beetham's broader based work on digital literacies (Beetham et al , 2009b).

The complexity of students' engagement with technology along with the results above, have demonstrated both diversity and conformity in their use of technology to support their learning (Jefferies, 2010). At Hertfordshire the MLE, StudyNet, has offered a valued backbone for accessing online materials, providing much of the students' early online support via module sites. As students developed as learners they reported searching beyond tutor-provided materials, across the internet for study support, often seeking out papers

from the academic databases to read. The potential for online searching and sifting allowed them to explore far and wide. Their favourable comments about using the MLE are here at variance with anecdotal academic comments from other institutions which have suggested that VLEs and MLEs are not widely appreciated by students and academics and that a personal learning environment (PLE) is preferred. I have already explored the uniqueness of Hertfordshire's environment with its in-house development of StudyNet. My earlier research into students' attitudes to StudyNet (for example, in Thornton et al, 2004; Jefferies et al., 2006) is supported by this latest research that the majority of students value highly their access to StudyNet and the online resources it supports.

These students are moving on beyond the view suggested by Laurillard at the start of the chapter as many of them become what they describe as 'independent' learners. The module leaders may support and direct but the students are demonstrating a personal agility with technology for enhancing their learning. They are choosing and developing their own blend of face-to-face learning and online support. In the case of those subjects which are still largely delivered via pen and paper notes, such as Midwifery, it is for the students to determine their choice of blend. In the case of, for example 'Ellen' and other philosophers there is evidence of a whole community online, with lecturers and students offering challenge, support and guidance.

A benefit of a longitudinal study has been in allowing the learners to see how far they have travelled. The interviews and the diaries indicate that students have reflected on their own growth in learning and appreciation of pedagogic styles alongside their use of increasing amounts of technology to support their learning. These students are becoming very similar to the sophisticated learner types reported by Beetham and Sharpe (2010) and Masterman

et al. (2010). They are selecting and choosing from what is on offer digitally and globally. Their growing maturity as learners is shown in the ability to articulate their learning needs and find things out online for themselves. They are learning to become independent learners and along the way finding their own strategies to support their learning needs. This study has described a rolling development through the diaries and interviews of the growth of the personal maturity of its learners. This was evidenced in their subjects and their use of technology in all the interviewed students and particularly in the case of the student, 'Rebecca', whose programme used minimal amounts of technology. She could comment on a personal development into independent learning supported by her own choices in her use of ICT. 'Matt' ( AI and Psychology) also reflected on his own changing learning styles through his studies as he worked out how he personally could become a successful learner and then supported others in the process.

The future role of technology in supporting education in the 21st century is not in doubt. The important issue for the students who are growing up in their 'always connected' environment is whether they complete the transformation to become independent learners. The initial pedagogy therefore becomes less important as they grow and develop their personal strategies for learning, because they report that they now know how to manage their learning within a blended environment. This is evidenced in the examples from the interviews:

'Rebecca' will go and seek out what she needs to know online to be an excellent midwife, regardless of her tutors' apparent lack of facility with e-learning.

'Dave' does not worry about studying abroad in an environment which makes little use of technology, because he knows where and how to access the supporting materials online.

‘Matt’ has reflected on how best he learns and what technology he needs, changing his own study habits to ensure he learns better and in the process is helping others to study.

‘Kristin’ first uses her tutors’ online materials and then explores the web to satisfy her fascination in learning about different types of literature.

‘Martin’ will continue to use his highly technical background to develop specialist programming skills. His confidence has been built up via his lecturers’ use of creative materials, which has taken him step by step through the skills he needs to learn.

‘Ellen’ blurs the boundaries between private and study use of social networking because of her enthusiasm for discussing philosophy and uses technology strategically to achieve the most out of a busy life.

‘Hannah’ has used her technical skills to support the group of students she works with and has no problems searching out relevant additional materials to help her understand her courses, on whichever globally accessible university site they are located.

‘Nick’ can adapt to different styles of pedagogy from his lecturers, whether it is learning via a wiki or with lecture material from his lecturers to supplement his own understanding.

This then is the evidence for the transformation in learning that Nichols (2010) was referring to when he considered the importance of blended learning (Chapter One). The students indicated a variety of experiences with pedagogy but in their comments on their developing ‘maturity’, they also identified that the responsibility for their learning lay with themselves.

In considering whether there is a demand for a new pedagogy for e-learning, the so-called ‘e-pedagogy’, I suggest that this set of students have shown that they can experience

multiple styles of pedagogy with which they are comfortable and successful and take on personal responsibility for seeking out additional material. They do not need a new e-pedagogy for e-learning since they have identified that they can learn through a variety of pedagogical approaches. Mayes and de Freitas have asserted that because of the growth in the use of digital technologies to enhance learning we are *'beginning to witness a new model of education, rather than a new model of learning,'* (Mayes, 2007;13).

Technology does not demand a specific pedagogy, as was noted by Nichols (2010) that: *'while "technology [is] also an enabler for adopting a specific pedagogy"(Weller,2002), it is not* ***determinative*** *[my use of bold] of any specific pedagogy.'* Furthermore, as Jones has indicated in his own work on the 'Net generation': *'…these changes in learning with technology are mediated by the active appropriation of technology by young people acting purposively in influential institutional contexts,'* (2010:2).

The outcomes of this research are complemented by emerging findings from Beetham and Sharpe's (2010) work into digital literacy, regarding the diversity of the student experience in learning, and with outcomes from Jones' ESRC study (2010) regarding the ubiquity of student use of technology and the diversity of pedagogies experienced. The work of Mayes and de Freitas (2007) has also indicated what the outcomes from this study have shown, that a specific new e-pedagogy to support e-learning and blended learning is not required since the students have described how they learn using technology through a variety of pedagogic approaches. The desirable elements for future campus-based education for undergraduates are the blending of digital technologies with face-to-face delivery of taught material. This is the new model for education which embraces opportunities for e-learning

but does not require the paradigm shift of a brand new e-pedagogy, which would require a reworking of pedagogic approaches specifically for e-learning.

## 7.4 Reviewing the contribution of the Venn diagrams and the new pedagogy/technology framework

Building on the work of the reflective diaries, I have proposed in this study two ways to explore with students their experience of blended learning. The first of these is the use of the Venn diagrams in the student interviews. This was intended as a personal way for students to explore their use of technology for learning and leisure. The manipulation by hand of the circles allowed them to engage with the process and produce a personal mapping. It could be argued that this is too imprecise and the outcome is merely a set of personal documents. I suggest that an exact measurement is unnecessary since it is the visual result which is important and the balance between the three areas which is of interest. While the placing and shuffling of the circles is designed to offer a subjective view of the three areas, the value has been in producing a diagram with student ownership of their experiences. All of the interviewees, except the Midwife, commented that their overall engagement with technology was greater than they had realised before they started the diaries. The value in using the circles as a physical artefact to discuss the balance of technology use in their lives lay in the students discovering their own high use of technology throughout their lives. The pedagogy/technology framework provides a matrix design through which students can identify the use of technology in their modules and the pedagogic approach used. Both sides are designed with bi-directional arrows to ensure it is not seen as a uni-directional device. The difference between this framework and those of e.g. Salmon and Moule is that it offers two planes, a horizontal as well as a vertical one. I

intend to undertake further research to compare and contrast different uses of the framework across a greater range of students. One of the design aspects I have already drawn attention to is the fact that it presents a snapshot from current experience rather than an opportunity to map progression over a period of time. Future work could explore the possibility of a 3D matrix allowing a concept of time to be brought in and displayed. A design aspect which I want to address in the future is how to use appropriate language to convey technical pedagogic terms to explain the matrix more simply to students.

## 7.5 Conclusions and future work

In this section I consider my contribution to practice and future work in researching the experience and pedagogy of blended learning.

My results summarised in section 7.1 indicate the value and importance of this study. My preliminary work on how students learn with digital technologies in the first decade of the 21st century has been complemented by similar outcomes from other studies considering the use of e-learning and blended learning and what it means to be an effective learner in a digital age. My study into how students experience the balance between pedagogy and technology offers a unique contribution to understanding how students learn with technology and how they experience it in their study lives.

My pedagogy/technology meta-framework has provided the basis for exploring how far the students' experiences of pedagogy might be influenced by the availability of technology. The examples I have provided through the student engagement with the framework indicate that it offered a straightforward and a useful way to explore how they experience different pedagogies within their programmes and take hold of their own learning at different stages. It is also easily transferable for other researchers to use and engage with. I anticipate that

future work will explore the testing and further refining of these two tools in multiple HE environments. This will serve to both inform the future debate on e-pedagogies and allow a comparison of results across a broader cohort of students. It will include both those who benefit from greater exposure to institutionally provided technologies and those who do not have the opportunities for learning in a blended environment.

My set of Venn diagrams has provided a clear, simple and visual way of allowing students to explore their use of technology in their lives and in their studies. The diagrams drew together the three themes of my study outlined in Chapter One and are easily transferable for other researchers to allow a comparative way of analysing students' use of technology and the time they devote to their studies. I anticipate further exploring the use of technology with students and academics in this way. The student experience of technology to support their learning remains a fascinating and complex area.

As Laurillard's words quoted in the chapter heading indicate, the blending of learning with technology is here to stay, whatever differing amounts of technology and face to face delivery of classes may be offered to students. Blended learning has been transformational for these students at the University of Hertfordshire in their undergraduate experiences. The technology clock cannot be turned back but the importance of using technology for enhancing learning lies in encouraging students to develop and grow as learners into independent graduates who are equipped for lifelong learning.

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# Appendices

## Appendix 1

### i. Student Questions for Video and Audio diaries – May 2007

Please speak/ record for between 5 and 10 minutes per day

**********

**DAY 1 Monday/Tuesday/Wednesday/Thursday/Friday/Saturday/Sunday**

*Start of day:* Please state the day and time. What are you expecting/ planning to do today?

*End of day:* Give an overview of what you have done today. Describe how you studied, did you:

- do your own reading,
- have a practical/ lecture,
- work on/ complete an assignment.

How many hours did you put into studying today?

How much technology did you use today in your learning? Explain any problems you encountered.

*Now tell us what you think for today's question…*

**Technology you enjoy**

Do you enjoy using technology for learning or leisure? Tell us about what you use

**********

**DAY 2 Monday/Tuesday/Wednesday/Thursday/Friday/Saturday/Sunday**

*Start of day:* Please state the day and time. What are you expecting/ planning to do today?

*End of day:* Give an overview of what you have done today. Describe how you studied, did you:

- do your own reading,
- have a practical/ lecture,
- work on/ complete an assignment.

How many hours did you put into studying today?

How much technology did you use today in your learning? Explain any problems you encountered.

*Now tell us what you think for today's question…*

**Difficulties with technology**

Do you have any difficulties using technology in every day life and in your studying? Tell us about them

What would make learning technology easier to use?

**********

**DAY 3 Monday/Tuesday/Wednesday/Thursday/Friday/Saturday/Sunday**

*Start of day:* Please state the day and time. What are you expecting/ planning to do today?

*End of day:* Give an overview of what you have done today. Describe how you studied, did you:

- do your own reading,
- have a practical/ lecture,
- work on/ complete an assignment.

How many hours did you put into studying today?

How much technology did you use today in your learning? Explain any problems you encountered.

*Now tell us what you think for today's question…*

**Social networks**

Have you used any social network technologies this week eg MySpace, Facebook, YouTube. Flickr? How do you use them? What do you like/dislike about them?

**********

**DAY 4 Monday/Tuesday/Wednesday/Thursday/Friday/Saturday/Sunday**

*Start of day:* Please state the day and time. What are you expecting/ planning to do today?

*End of day:* Give an overview of what you have done today. Describe how you studied, did you:

- do your own reading,
- have a practical/ lecture,
- work on/ complete an assignment.

How many hours did you put into studying today?

How much technology did you use today in your learning? Explain any problems you encountered.

*Now tell us what you think for today's question…*

**Staff improving learning**

How can your lecturers use technology (including StudyNet) to improve your learning?

What tricks are they missing or what ideas could they use?

**********

**DAY 5 Monday/Tuesday/Wednesday/Thursday/Friday/Saturday/Sunday**

*Start of day:* Please state the day and time. What are you expecting/ planning to do today?

*End of day:* Give an overview of what you have done today. Describe how you studied, did you:

- do your own reading,
- have a practical/ lecture,
- work on/ complete an assignment.

How many hours did you put into studying today?

How much technology did you use today in your learning? Explain any problems you encountered.

*Now tell us what you think for today's question…*

**Inspiring learning?**

What was the most enlightening thing you did in your studying this week? Did anything inspire you in learning? And what about exams and assessments, does online learning prepare you for these?

**********

Thank you very much for completing your diary recordings. Please return your equipment to the BLU office in the College Lane LRC,
email: a.l.jefferies@herts.ac.uk

## ii. Student Questions for Video and Audio diaries October 2007

**********

**Day 1**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

**Surprise question:**

What is your favourite piece of technology that aids your learning? Tell me about it and how it aids you in your learning.

**********

**Day 2**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

**Surprise question:**

How has your use of technology to support learning changed in the last year?

**Day 3**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

**Surprise question:**

How confident do you feel using technology? What extra support would be useful? Where would you get this support from?

**********

**Day 4**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

**Surprise question:**

How do you divide out your studying and personal time?

**********

**Day 5**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

**Surprise question:**

Do you think social networks (face book, my space etc) could be used to aid learning?

**********

**iii. Student Questions for Video and Audio diaries March 2008**

**********

**Day 1**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

In October 2007 you said you used X as your favourite technology?

What is it now?

**********

**Day 2**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

1. How has your learning changed over the last three years through to University? Have the technologies that you have used in those 3 years changed?
2. Tell me about five technologies that you have and use frequently? Do you use them to aid your learning, or to relax? How do you use them?

**********

## Day 3

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

1. Do you have a daily routine when it comes to using technology in your learning? e.g. every day do you check StudyNet, your university / personal emails, social networks etc?
2. How often do you check StudyNet (if you don't check it daily)? What parts of StudyNet do you use?

**********

## Day 4

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

1. Thinking back to when you started College/ University, did you find that you had sufficient support in using technology to aid your learning? What other support would have been useful?
2. What is the biggest change in learning that you have experienced in the years that you have been at University?

**iv. Student Questions for Video and Audio diaries October 2008**

**********

**Day 1**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

In October 2007 you said you used X as your favourite technology?

What is it now?

**********

**Day 2**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

3. How has your learning changed over the last three years through to University? Have the technologies that you have used in those 3 years changed?
4. Tell me about five technologies that you have and use frequently? Do you use them to aid your learning, or to relax? How do you use them?

**********

**Day 3**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

3. Do you have a daily routine when it comes to using technology in your learning? e.g. every day do you check StudyNet, your university / personal emails, social networks etc?
4. How often do you check StudyNet (if you don't check it daily)? What parts of StudyNet do you use?

**********

**Day 4**

**Date: _____**

**Start of day**: Please state the day and time. What are you expecting / planning to do today?

**End of day**: Give an overview of what you have done today.

Describe how you studied – for example, did you:

- Study independently
- Attend a teaching session (e.g. lecture, practical, seminar, tutorial)
- Work on / complete an assignment.

How many hours did you put into studying today?

How did you use technology today in your learning?

3. Thinking back to when you started College/ University, did you find that you had sufficient support in using technology to aid your learning? What other support would have been useful?
4. What is the biggest change in learning that you have experienced in the years that you have been at University?

# Appendix 2 Data Collection Methods for diaries

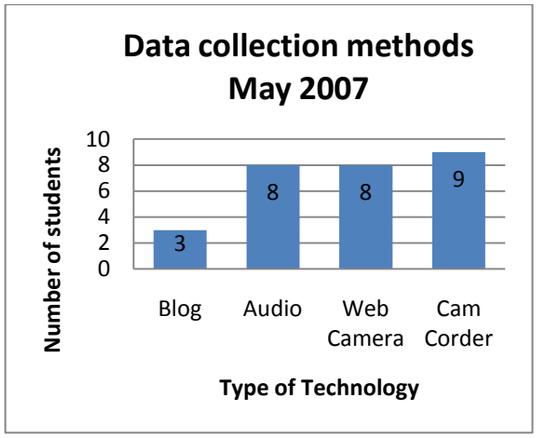



Figure 1 May 2007 28 diary participants

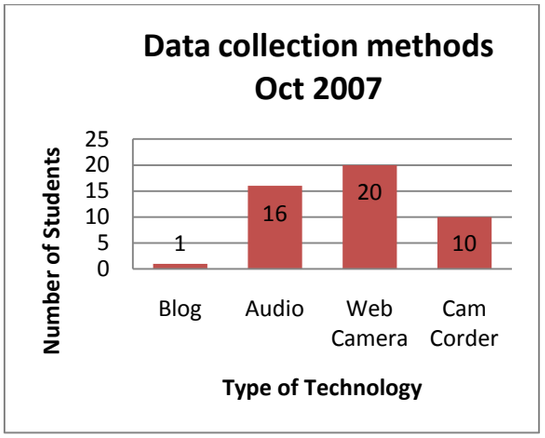



Figure 2 October 2007 47 diary participants

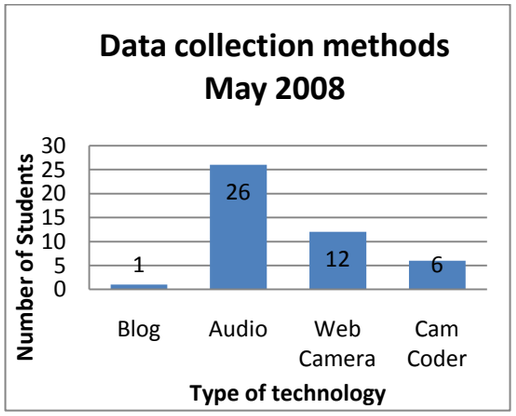



Figure 3 March 2008 45 diary participants

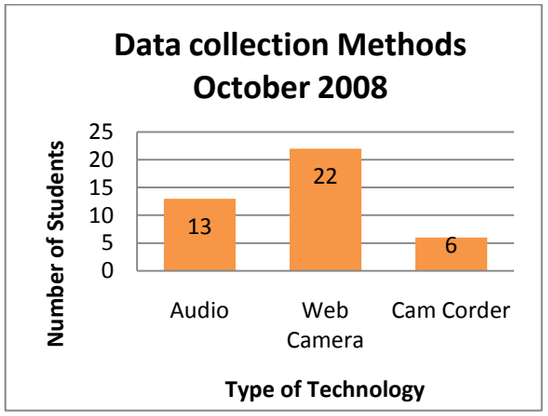



Figure 4 October 2008 41 diary participants

# Appendix 3 Student Diaries – The online survey used to gather background information



**STROLL Learner Background Survey**

University of Hertfordshire

## Welcome to the STROLL Learner Background Survey

We are inviting you to take part in this survey so we can have a better understanding of the background of the students participating in the STROLL study and their current and previous experiences of using technology to support their learning. This questionnaire contains 15 questions and is for research purposes only. We will give you further opportunities to tell us about your experiences of using technology next term.

All data will be held securely in accordance with the University of Hertfordshire's Ethics procedures and will only be available to the research team. If you have any questions please contact Ruth Hyde STROLL Research Assistant (r.s.hyde@herts.ac.uk) or Amanda Jefferies STROLL Project Director (a.l.jefferies@herts.ac.uk )
Thanks very much for your support

The STROLL team

---

## STROLL Participant Survey

If you need to stop completing this survey part way through click onto the **FINISH LATER** button below.

Once you have answered **all** the questions below and are ready to submit the completed survey, click on the **CONTINUE** button at the bottom of the page. Your answers will be submitted **or** you will be prompted to fill in an answer you may have over-looked.

**Once your answers are accepted as submitted you cannot return to review or amend this page.**

**Your details**

**1.** Please complete your contact details (required)

| | First Name | Surname | E-mail | Age |
|---|---|---|---|---|
| | | | | |

**2.** Gender

○ Male ○ Female

**3.** First Language:

English

Other *(please specify)*:

**4.** Educational status:

In full time education  In part time education

**5.** Employment status:

Full time 30+ hours  Part time  Unemployed

**6.** Main programme of study:

Foundation  Undergraduate year 1  Undergraduate year 2  Undergraduate year 3

Undergraduate year 4  Postgraduate

Other *(please specify)*:

**7.** Main place of study:

Home/student residence  Home/residence using a computer connected to internet

Workplace  College/university/(LRC)learning centre

Other *(please specify)*:

## Information about your technology use

**8.** I have access to a networked computer:
*(select all that apply)*

At home/student residence  At work  At university/college/LRC(learning centre)

Other *(please specify)*:

**9.** I normally use a computer:

Every day  A few times a week  Occasionally  Rarely  Never

**10.** I own and use the following:
*(select all that apply)*

mobile phone

iPod or mp3 player

laptop

digital camera

webcam

palmtop or personal digital assistant (PDA)

- [ ] account on eBay
- [ ] account on social space (e.g. Facebook, MySpace, Bebo)
- [ ] own blog or web site

**11.** I find it easy to access/use my own personal technologies at my place of learning:

( ) yes ( ) no

**12.** If you answered 'no' to Question 11 above, please briefly describe any difficulties you have encountered. *(Optional)*

**13.** As a learner, I have experience of:
*(select all that apply)*

- [ ] Contacting tutor using email
- [ ] Accessing course materials via StudyNet/Blackboard
- [ ] Using an online discussion forum to work with learners
- [ ] Using a search engine to gather information
- [ ] Using an electronic portal to gather information
- [ ] Using Word to write an assignment
- [ ] Using a web page or blog to present information
- [ ] Using Powerpoint to present information
- [ ] Using an e-portfolio
- [ ] Using an electronic whiteboard in class
- [ ] Taking computer-based tests
- [ ] Video or audio conferencing
- [ ] Learning via a mobile phone or PDA

**14.** Do you have any access-to-learning issues: *(Optional)*
*(select all that apply)*

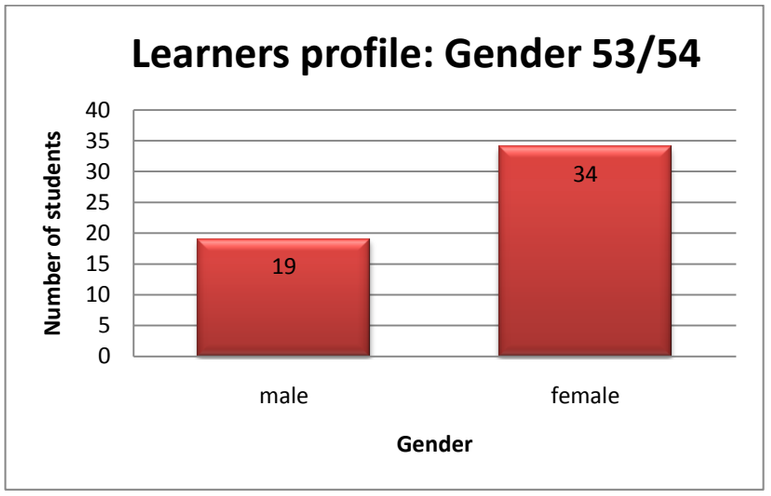
[ ] Visual Disabilities [ ] Auditory Disabilities [ ] Learning Difficulties [ ] Mobility and Motor Disabilities [ ] Language and Communication Issues

[ ] Other *(please specify)*:

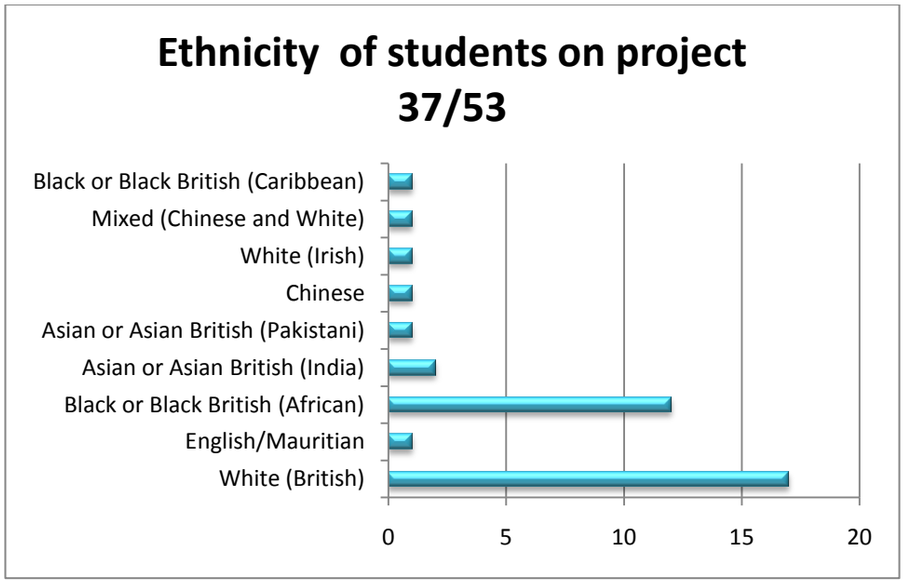
**15.** Ethnicity(Optional)
Please select the category that you feel best describes your ethnic origin using the 2001 Census classification below.
*(Optional)*

- White (British)
- White (Irish)
- Black or Black British (Caribbean)
- Black or Black British (African)
- Asian or Asian British (India)
- Asian or Asian British (Pakistani)
- Asian or Asian British (Bangladesh)
- Mixed (White and Black Caribbean)
- Mixed (White and Black African)
- Mixed (White and Asian)
- Chinese
- Other *(please specify)*:

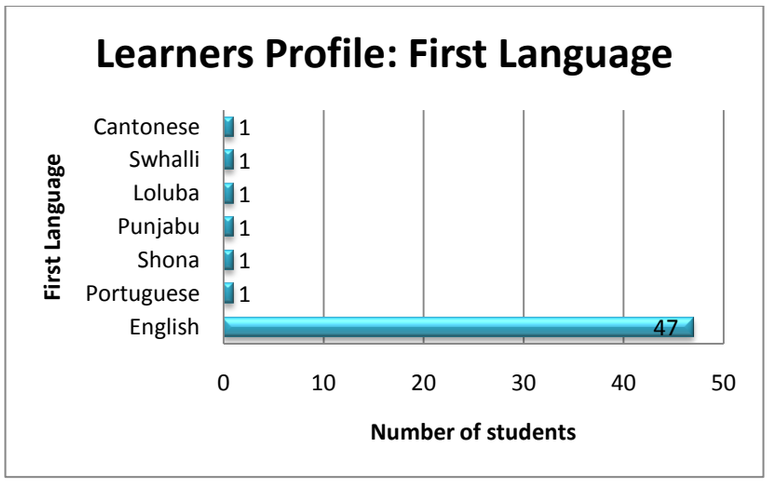
**Graphical representation of the data from the Student Questionnaires in the preliminary stage**

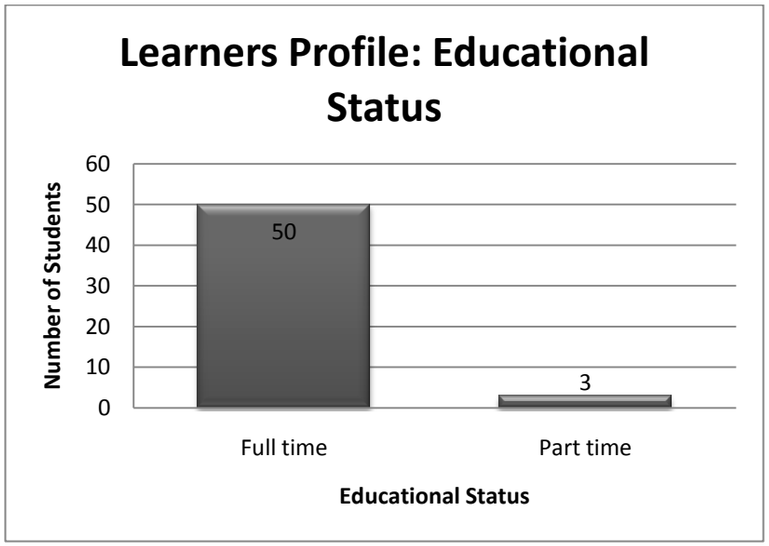


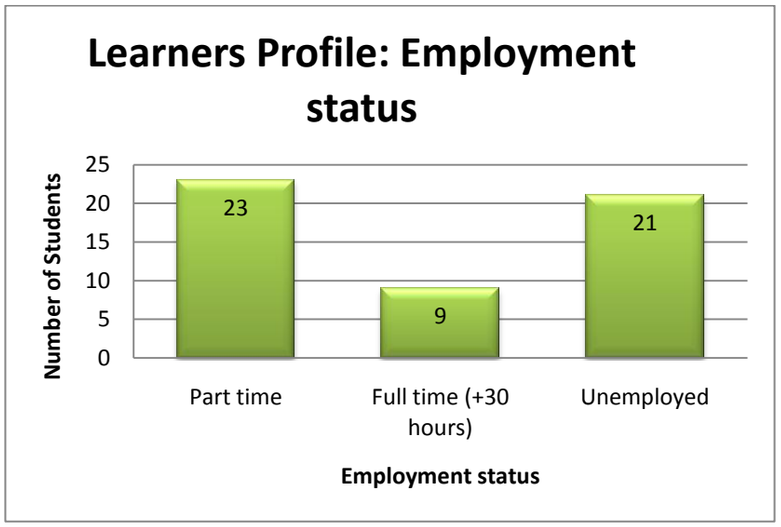

NB Only 53 of the 54 students recording their diaries submitted a questionnaire

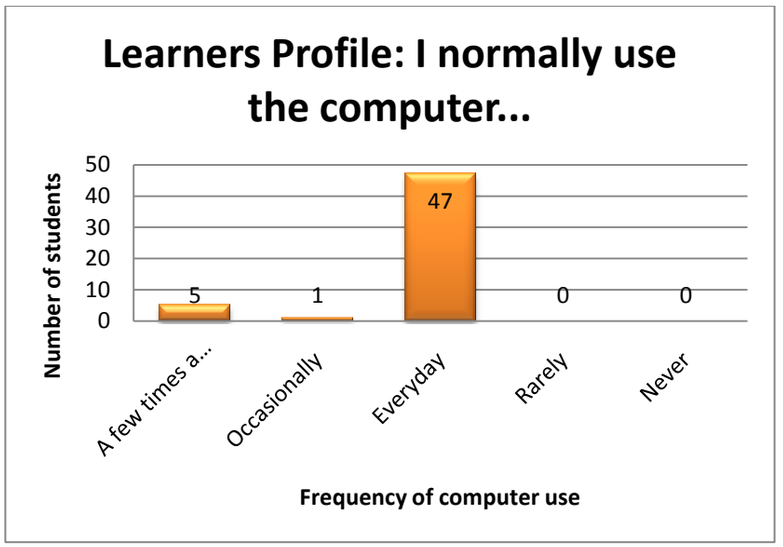


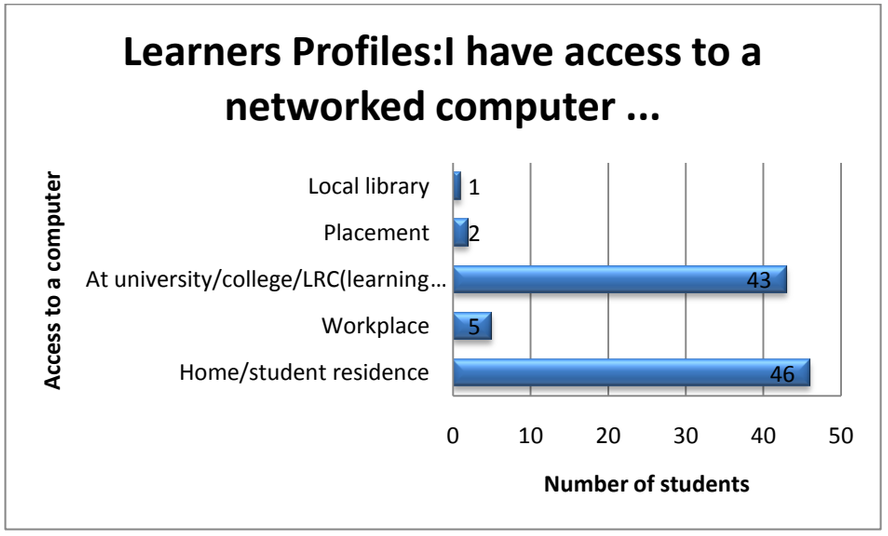

NB. Only 37 of the 53 students submitting questionnaires answered the question on ethnicity

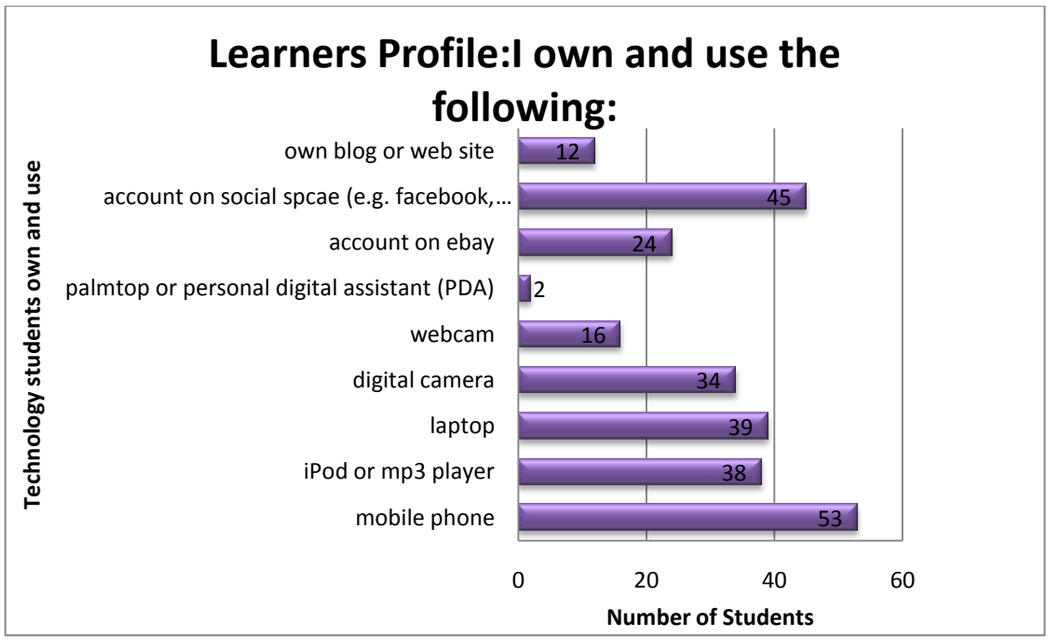

Learners Profile: First Language
First Language
Cantonese
Swhalli
Loluba
Punjabu
Shona
Portuguese
English
1
1
1
1
1
1
47
0
10
20
30
40
50
Number of students

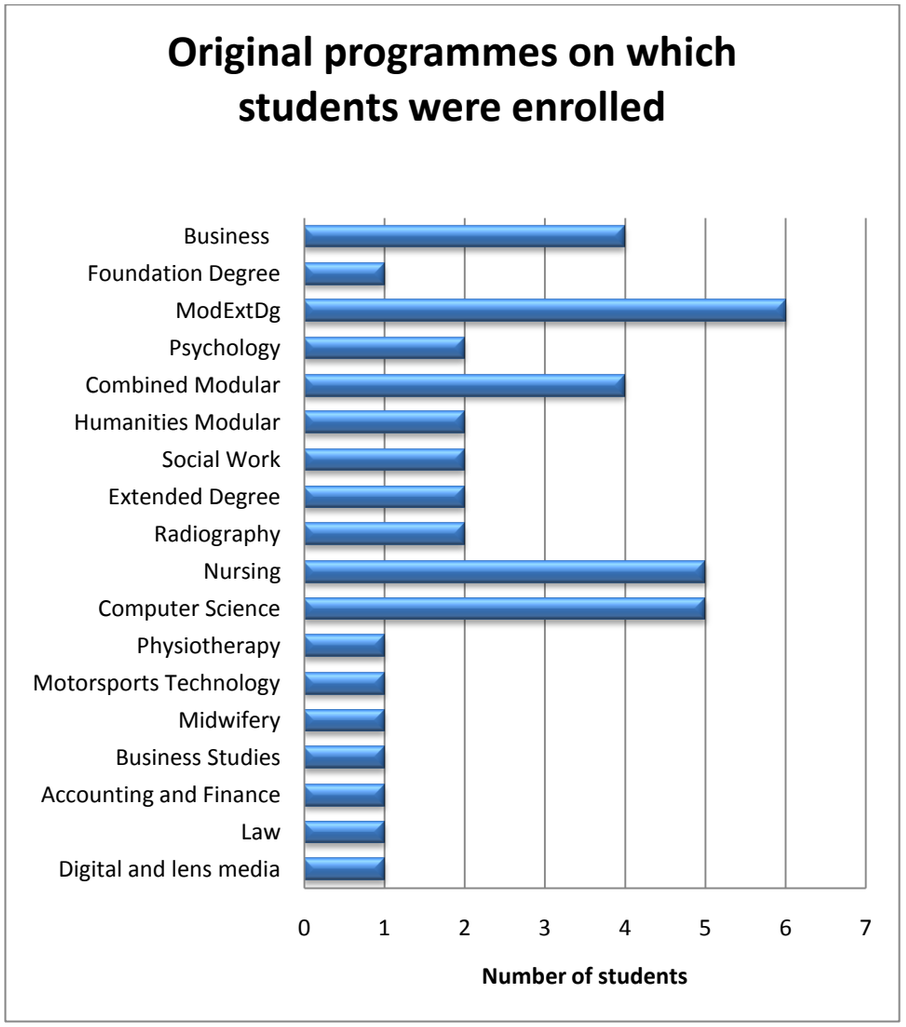

Learners Profile: Educational Status
Number of Students
60
50
40
30
20
10
0
50
3
Full time
Part time
Educational Status


Learners Profile: Employment status
Number of Students
25
20
15
10
5
0
23
9
21
Part time
Full time (+30 hours)
Unemployed
Employment status


Learners Profile: I normally use the computer...
Number of students
50
40
30
20
10
0
5
1
47
0
0
A few times a...
Occasionally
Everyday
Rarely
Never
Frequency of computer use


Learners Profiles:I have access to a networked computer ...
Access to a computer
Local library
Placement
At university/college/LRC(learning...
Workplace
Home/student residence
1
2
43
5
46
0
10
20
30
40
50
Number of students


Learners Profile:I own and use the following:
Technology students own and use
own blog or web site
account on social spcae (e.g. facebook,...
account on ebay
palmtop or personal digital assistant (PDA)
webcam
digital camera
laptop
iPod or mp3 player
mobile phone
12
45
24
2
16
34
39
38
53
0
20
40
60
Number of Students


Original programmes on which students were enrolled
Business
Foundation Degree
ModExtDg
Psychology
Combined Modular
Humanities Modular
Social Work
Extended Degree
Radiography
Nursing
Computer Science
Physiotherapy
Motorsports Technology
Midwifery
Business Studies
Accounting and Finance
Law
Digital and lens media
0
1
2
3
4
5
6
7
Number of students

## Appendix 4 Ethical Agreement

**1. Copy of the original Agreement for the video and audio diaries for the STROLL project- subsequently renewed**

---

**UNIVERSITY OF HERTFORDSHIRE**
**FACULTY OF ENGINEERING AND INFORMATION SCIENCES**

# M E M O R A N D U M

**TO:** **Amanda Jefferies**

**c/o:**

**FROM** Professor Alan Davies, Chair - Faculty Ethics Committee

**DATE** 3 April 2007

---

Your project entitled

**STROLL – JISC Funded Project**

has been granted ethics approval and has been assigned the Protocol Number: 07/47

This approval is valid

from 1 May 2007

until 30 April 2008

If it is possible that the project may continue after the end of this period you will need to resubmit an application in time to allow the case to be considered.

**2. Email correspondence with the SSAHRI Ethics Committee Chair to confirm that the STROLL programme which provided the foundational data for my EdD had been granted ethics approval.**

---

Envelope-to: A.L.Jefferies@herts.ac.uk
X-Mailer: QUALCOMM Windows Eudora Version 7.1.0.9
Date: Thu, 31 May 2007 09:47:57 +0100
To: Amanda Jefferies <A.L.Jefferies@herts.ac.uk>
From: Tim Parke <T.Parke@herts.ac.uk>
Subject: Re: Ethics permission for EdD
X-M-UH-MailScanner-Information: UH-M-mail
X-UH-MailScanner: No Virus detected

*On Helen Burchell's suggestion I am writing to confirm that I have been granted ethics approval through EIS for my STROLL project which will provide the basis of the data gathering for my EdD programme. The Protocol Number is 07/47 and it is currently valid until April 2008 and will be renewed for a further 6 months afterwards*

Hi Amanda

Thanks for this - all is in order, and there is nothing further to do.

Best wishes

Tim Parke

Tim Parke
Linguistics
University of Hertfordshire
School of Humanities
de Havilland Campus
Hatfield
AL 10 9AB

44 +(0)1707 285701:direct
44 +(0)1707 285616: fax

# Appendix 5 Student Consent Form

## (signed by all participants in audio/video diaries after attending the project presentation)

---

**Consent for the use of Audio /Video/Word Document Data.**

The primary purpose of asking STROLL participants to record Video diaries is their value as an important source of data for us to analyse.

In addition, the STROLL team wish to include some edited Video / Audio clips as part of the STROLL project's dissemination output. This is because video can be particularly powerful at representing the views of the participants.

These video / Audio clips will be used to support presentations and also made available to interested parties (e.g. JISC, and Higher Education Academy and lecturers in Higher Education or Further Education), via such methods as DVD, video files embedded in electronic documents or streamed over the Internet (please note, we have no control over how the files might be used subsequently and do not accept responsibility for any such use).

You are not obliged to allow the STROLL team to make clips from your video / Audio data available in these ways (they will still be used for the primary function as a source of data for us to analyse).

For our records, please indicate how you would like your video data to be handed by signing **one** of the declarations below:

**Declaration 1**

I consent to any edited clips from my video/audio/Word document data to be made available in STROLL dissemination output (as described above).

Signed:_____ Date:_____

Name:_____

**Declaration 2 (alternative to 1)**

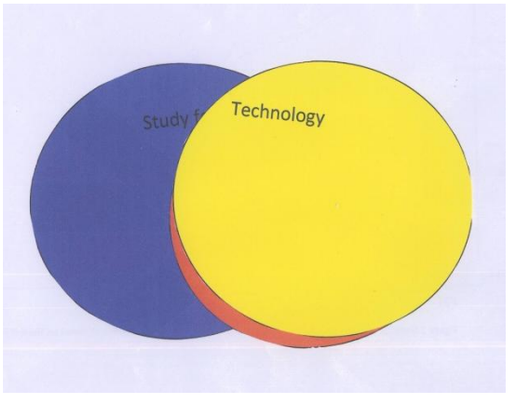
I wish to view any edited clips from my video / Audio / Word data before deciding whether or not to give consent for that particular clip to be made available in STROLL dissemination outputs (as described above)

Signed:_____ Date:_____

Name:_____

# Appendix 6 The Student Venn diagrams from the Interviews

Appendix 6.1 A Philosophy Student's Experience



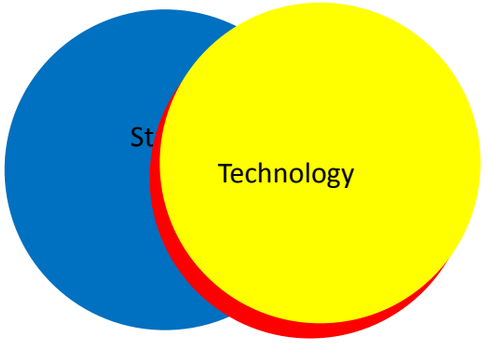
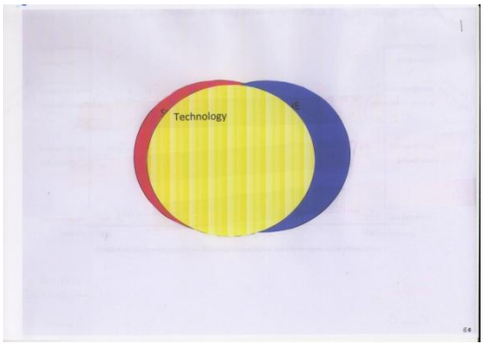




Figure 6.3.1 A Philosophy Student's experience: Ellen's Jpeg and Venn diagrams

The circles indicate a very high reliance personally on technology.

Appendix 6.2 A Computer Scientist's experience



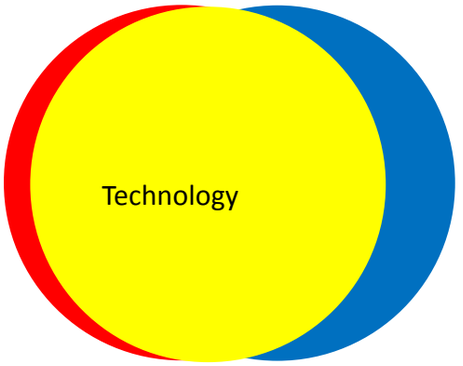
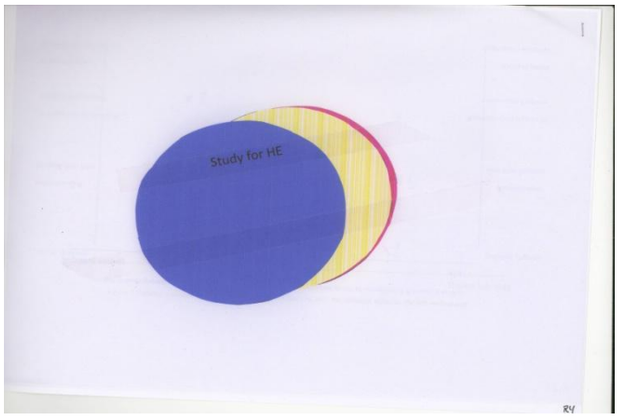




Figure 6.3.2 A Computer Science Student's Experience: Hannah's Jpeg and Venn diagram

The circles indicate a very high degree of overlap between the student and technology and a smaller degree of overlap between student/technology and studying

Appendix 6.3 An International Business Student's Experience



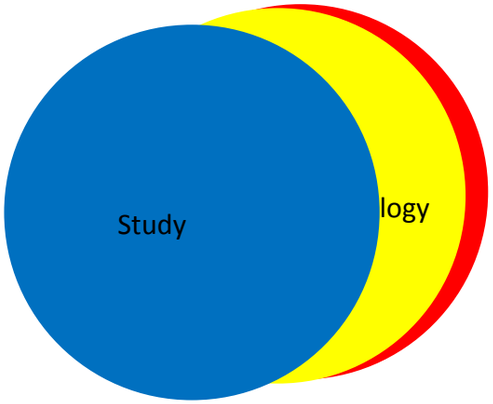
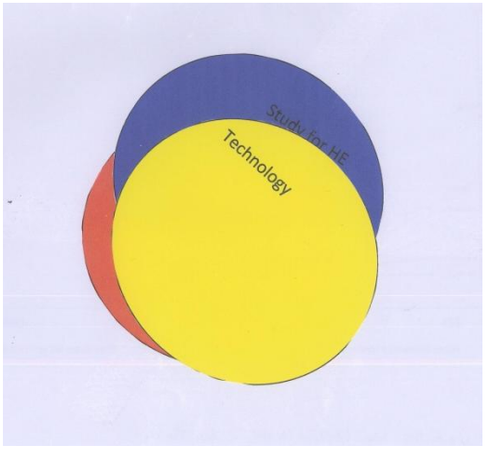
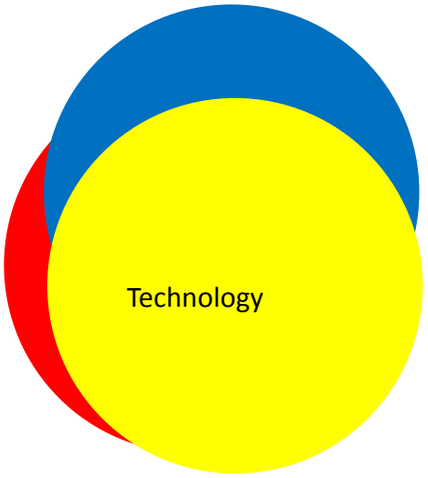




Figure 6.3.3 An International Business Student's Experience: Dave's Jpeg and Venn diagram

The circles indicate a high level of personal technology use and medium level of technology use for study time

Appendix 6. 4 A Digital Technology Student's experience

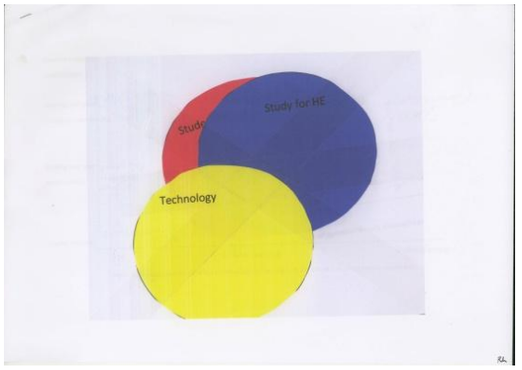



A Digital Technology Student's experience: Martin's Jpeg and Venn diagram

The circles indicate a high overlap between study and technology as befits his programme as well as a high overlap between the student and technology

Appendix 6.5 A Midwifery Student's Experience



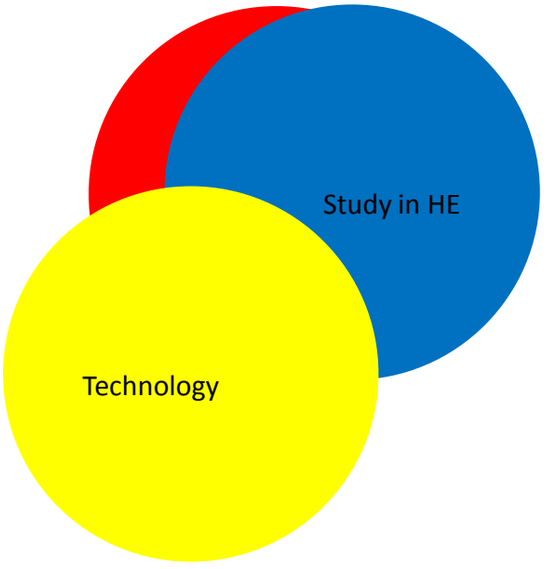
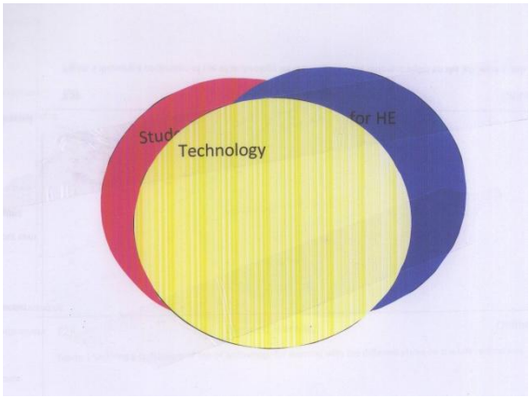
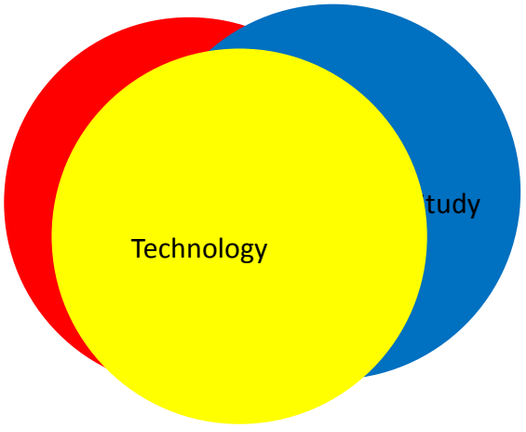




Figure 6.3.5 A Midwifery Student's Experience: Rebecca's Jpeg and Venn diagram

The circles indicate only moderate amounts of technology used for study in spite of the availability of blended learning throughout the programme.

Appendix 6.6 A Business Studies Student

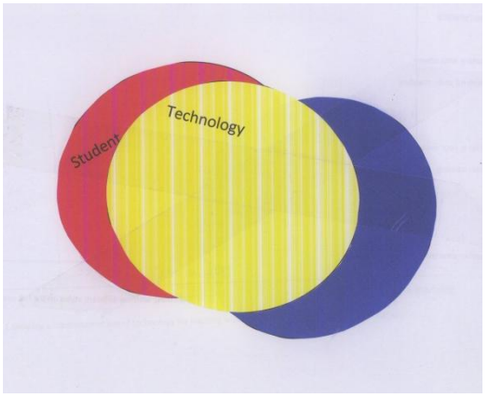


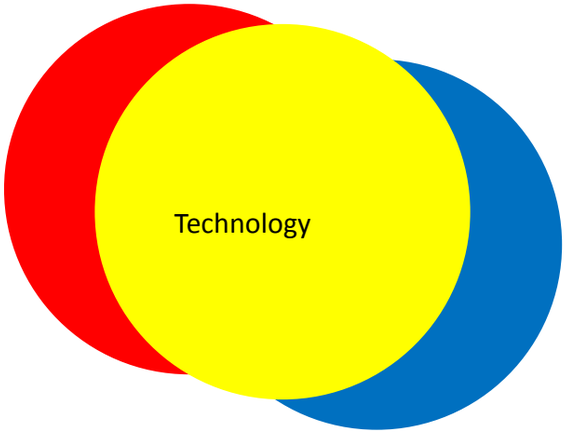




A Business Studies Student's Experience: Nick's Jpeg and Venn diagram

The circles indicate a significant amount of technology use for study and personally

Appendix 6.7 An English Student's Experience

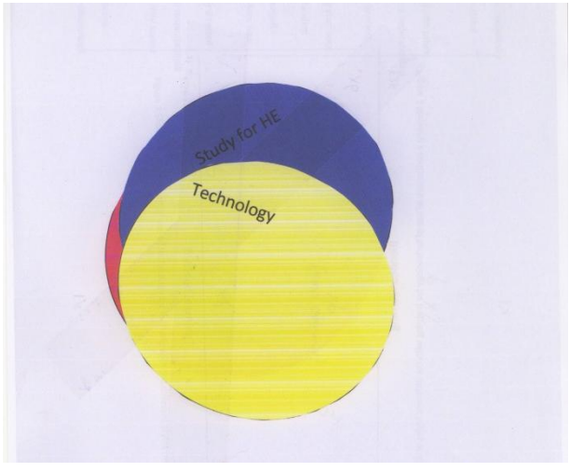


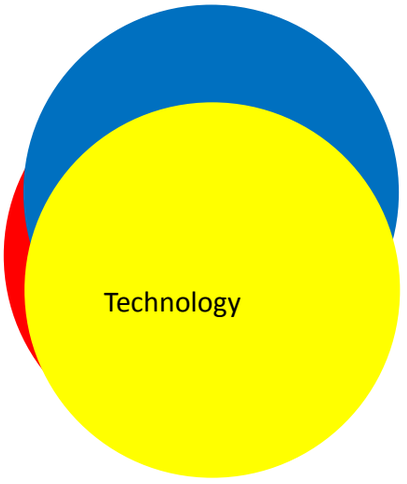




An English Student's Experience: Kristin's Jpeg and Venn diagram

The circles indicate less time used in study but a high personal use of technology.

Appendix 6.8 An AI and Psychology Student's Experience




An AI and Psychology Student's Experience: Matt's Jpeg and Venn diagram

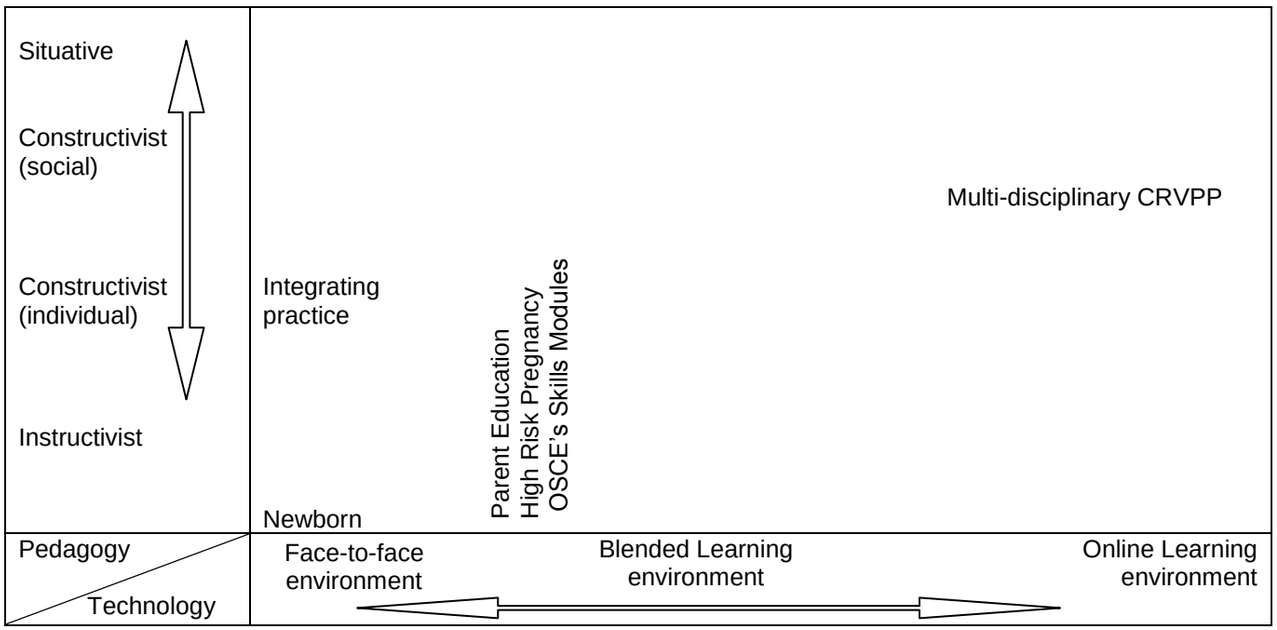
The circles indicate a significant overlapping of technology with the student and a smaller overlap of technology onto study

# Appendix 7- Examples of Three Student Pedagogy/Technology Diagrams

### i. A Midwifery Student's Experience - Rebecca's diagrams

- Figure 6.3.5 copied from Chapter Six

- Rebecca's original drawings and identification of the pedagogy



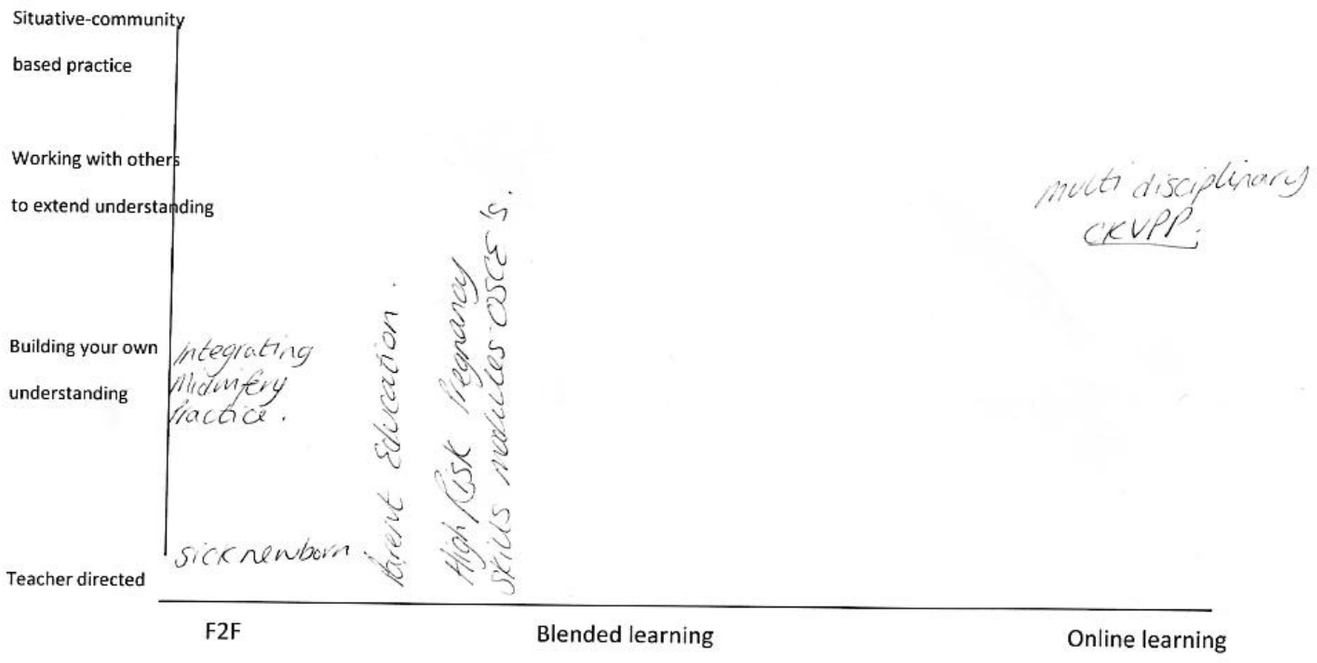
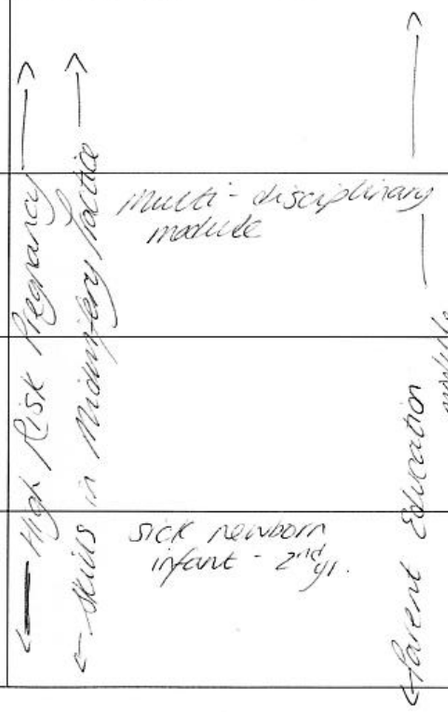



Figure 1 Showing a continuum of use of technology for learning with the different styles on the left vertical axis

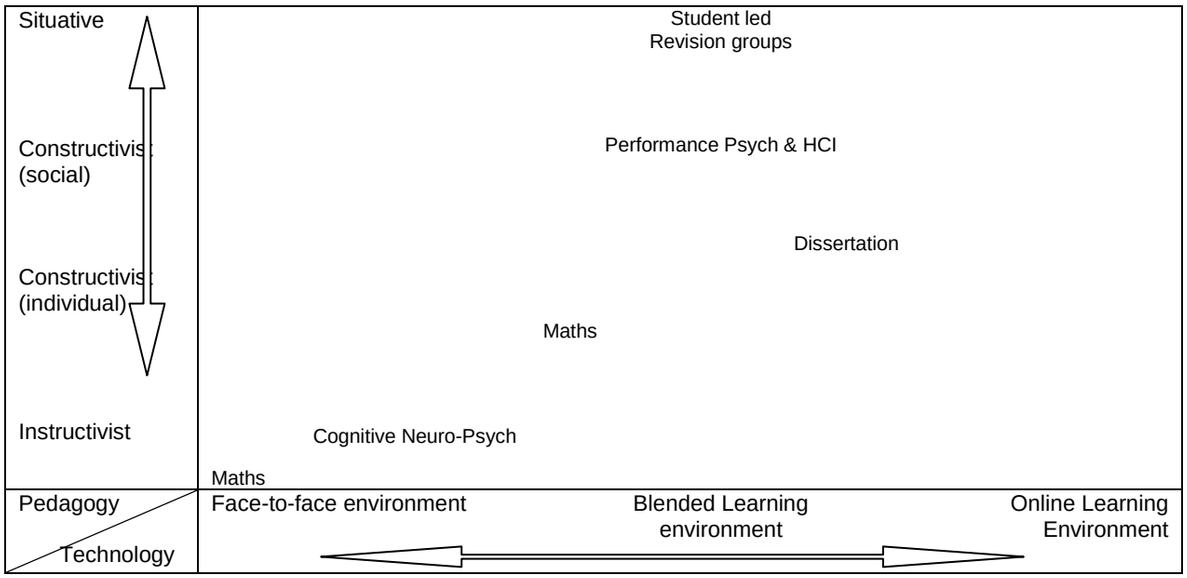
| Types of teaching/learning | My experiences |
|---|---|
| Situative-community based practice |  |
| Working with others to extend understanding | |
| Building your own understanding | |
| Teacher directed | |



Note: Extension of first diagram to show types of teaching/learning interaction as a first step to understanding students' descriptions of learning

**ii. An AI and Psychology Student's Experience - Matt's Diagrams**

- Figure 6.3.5 copied from Chapter Six
- Matt's original drawings and identification of the pedagogy



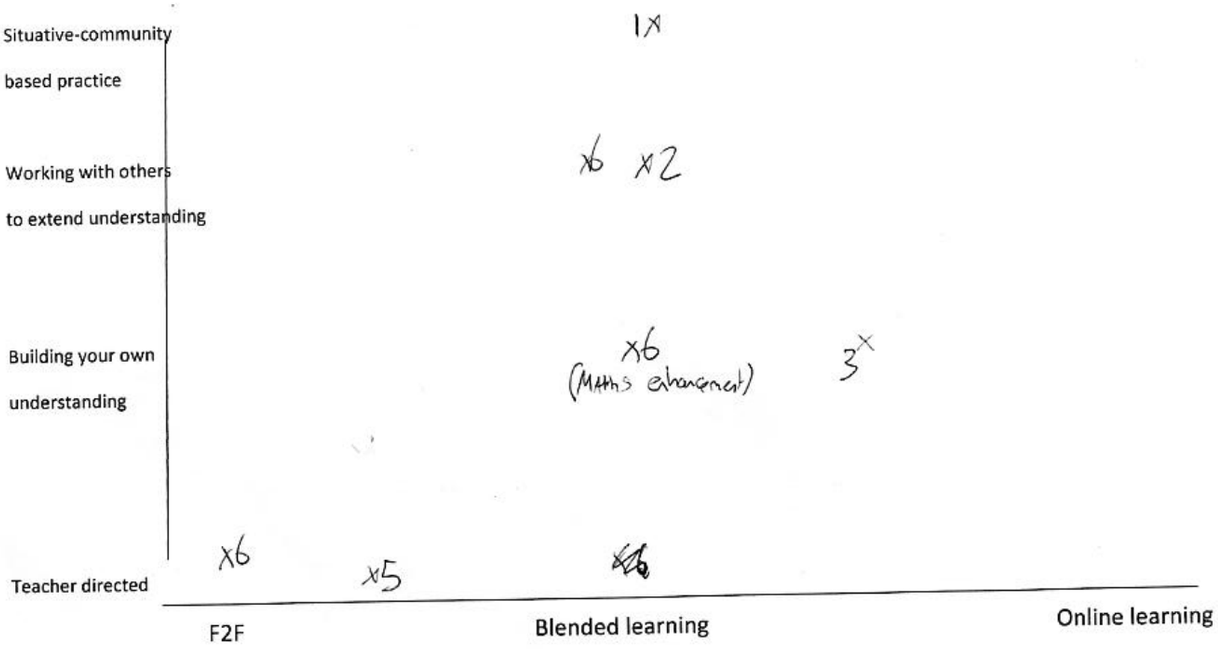


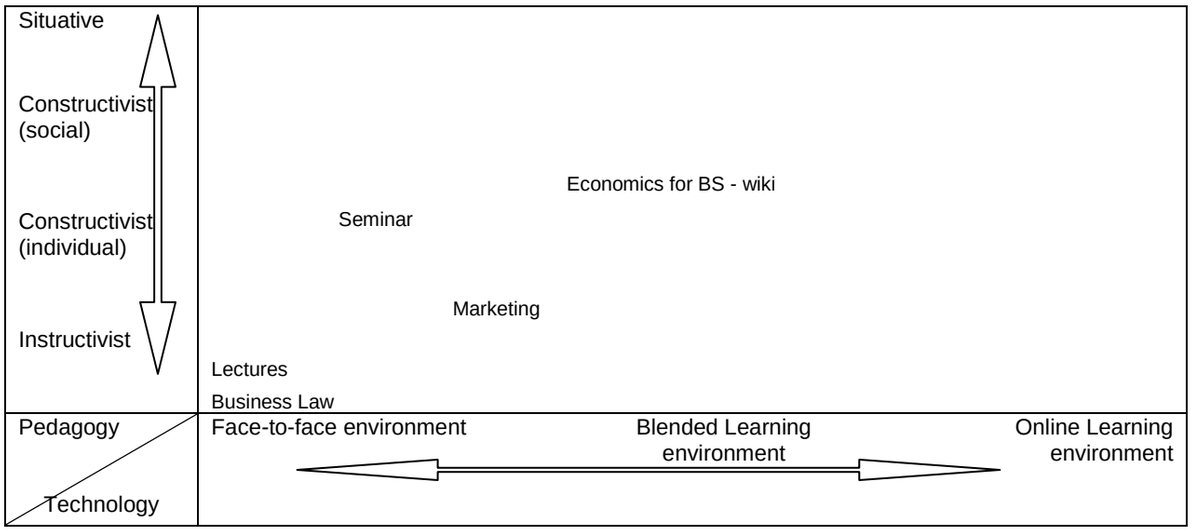

Figure 1 Showing a continuum of use of technology for learning with the different styles on the left vertical axis

| Types of teaching/learning | My experiences |
| --- | --- |
| Situative-community based practice | 1 Revision groups (student led) |
| Working with others to extend understanding | 2 Human Computer interaction |
| Building your own understanding | 3 Dissertation |
| Teacher directed | 4 Performance psychology<br>5 Cognitive Neuropsyc |

Note: Extension of first diagram to show types of teaching/learning interaction as a first step to understanding students' descriptions of learning

### iii. A Business Studies Student's Experience - Nick's Diagrams

- Figure 6.3.6 copied from Chapter Six
- Nick's original drawings and identification of the pedagogy



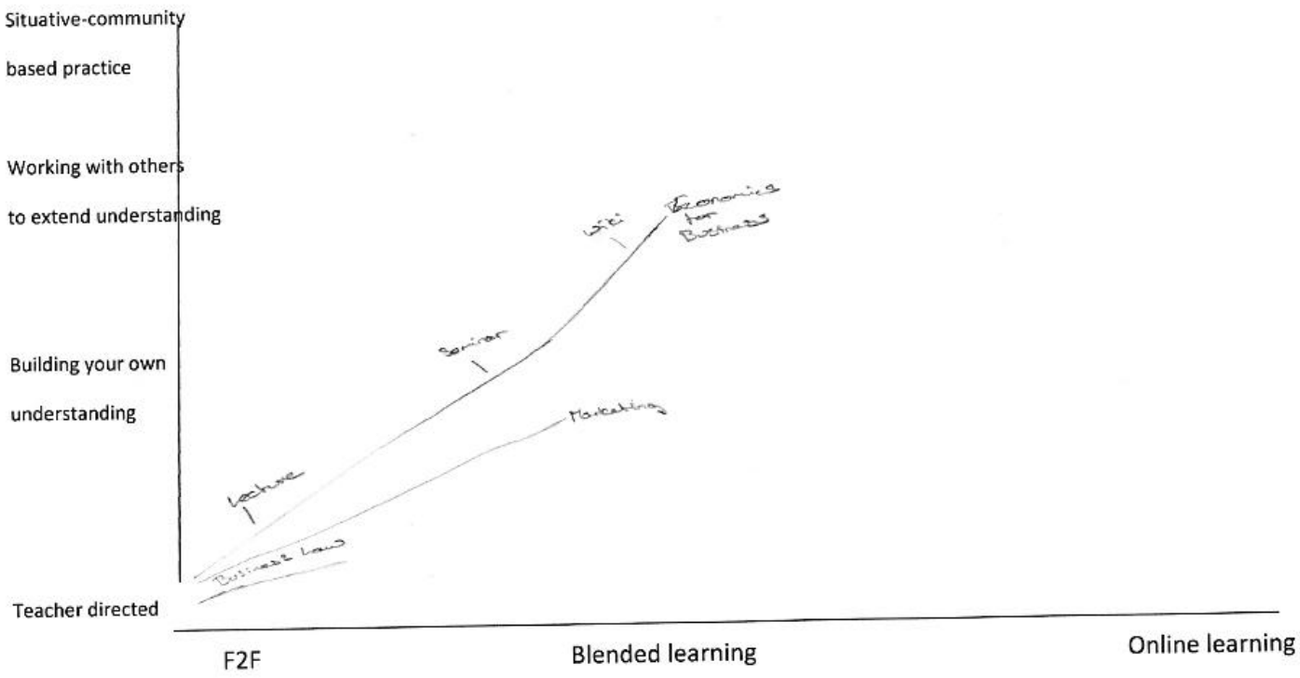



Figure 1 Showing a continuum of use of technology for learning with the different styles on the left vertical axis

| Types of teaching/learning | My experiences |
|---|---|
| Situative-community based practice | |
| Working with others to extend understanding | Economics for Business - writing |
| Building your own understanding | Marketing Poster - group work |
| Teacher directed | Business Laws |

Note: Extension of first diagram to show types of teaching/learning interaction as a first step to understanding students' descriptions of learning

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