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**TEACHING WITHIN A UNIVERSITY: AN INDEPTH STUDY OF THE EVERY  
DAY USE OF TECHNOLOGY**

**LYNNE JUMP**

The thesis submitted in partial fulfilment of the requirements of the University of Greenwich  
for the Degree of Doctorate of Education

September 2011

## DECLARATION

*“I certify that this work has not been accepted in substance for any degree, and is not concurrently being submitted for any degree other than that of the Doctorate of Education being studied at the University of Greenwich. I also declare that this work is the result of my own investigations except where otherwise identified by references and that I have not plagiarised the work of others”.*

Signed:

Lynne Jump

Professor Patrick Ainley

Dr Jane Barnard

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## ABSTRACT

The assumptions underpinning this study are that in order to understand the real use of technology in teaching it is necessary to examine the everyday world of the university (Eisner & Peshkin, 1990, p. 99) and then to 'tell it as it is'. The enquiry process is approached from a disciplinary context by capturing the views and actual practice of technology use in teaching of thirteen academics from different disciplinary fields within one university. A case study methodology framed the design of the study, requiring the collection of data from a variety of sources in order to describe the university which defined the study. My intention was to answer the following question:

**How is the use of technology shaped by the everyday teaching practice of academics within a university?**

The aim of the study therefore was to explore the use of technology by examining the academic's views about how technology affected the way that they understood teaching. A feature of contemporary research into technology and teaching is an emphasis on small, context specific case studies. These often separate teaching and learning from other aspects of cultural practice, such as disciplinary and other institutional influences. In this study Bernstein's theory of pedagogic discourse and his categories of recognition and realisation, along with the concepts of classification and framing provided a detailed coding structure as a way of analysing the resulting interview data.

Analysis of practical examples of technology use in teaching revealed that academics are influenced by ideological conceptions of epistemic and social relations that are inherent within their own values and beliefs about their own roles and those of students. The coding structure revealed a variety of pedagogic practice linked to vertical (i.e complex) language use or horizontal (i.e everyday) language use. The detailed case studies of technology use by the individual academics gave rise to four different categories of teaching - knowledge and knower modes of teaching, with a vocational or non-vocational focus.

This thesis contributes to professional knowledge in this field because of the use of a social theory which highlights the complex relationship between technology and pedagogic discourse and the institutional and disciplinary forces that shape the relationship.

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## CHAPTER 1: RATIONALE FOR THE STUDY AND RESEARCH METHODOLOGY

Overview of the chapter content

Chapter 1 is composed of two sections. In the first, I consider some of the personal and contemporary issues that have shaped the function and structure of this research study and in the next section I describe the purpose and justification for the research methodology.

Section 1 begins by exploring my own particular circumstances and motivations for this inquiry along with some of the exploratory, evaluation projects that influenced the design of the study as a way of setting a broader context, I also consider some of the definitions and influences from the field of technology in university teaching, which affected my approach to the collection of data. This leads onto an examination of the impact of a particular type of inquiry that has emerged in the field of e-learning, that is the case-study research methodology and how this is used in the study, focussed by a research question. The study is strongly influenced by the work of Basil Bernstein, and a brief overview of his theory of pedagogic discourse is presented as a way of introducing the language, and concepts that I have used in the design and implementation of the study.

In section 2 I describe in detail the inquiry process and how the framework that guided the analysis of the interview transcripts was derived from Bernstein's theory. My aim was to answer the research question by exploring what individual academics recognise to be teaching with technology and how those beliefs are then realised into their teaching practice; therefore I explain the methods of data collection and analysis used in order to answer that question.

### Introduction

The purpose of this professional doctorate thesis is to document the results of an inquiry that intended to answer the question: How is the use of technology shaped in the everyday teaching practice of academics in a university?

Before I set out to explain the situation and context of the inquiry, it is worth documenting what the thesis is not about. Much discussion about the use of technology in university teaching has tended to concentrate upon its potential for innovation, for example books that affect current practice tend to have titles such as 'Rethinking Pedagogy for a Digital Age'

(Beetham & Sharpe, 2007) and conference titles lure prospective participants by constructing titles such as ‘Enhanced and Transformed: Tales from the Digital Age’ (University of Greenwich e-learning conference 2011). These titles are examples of how technology is so often presented in logic of change, modernisation and innovation in teaching. My intention in this thesis, however, is to present the findings of an inquiry that changes the emphasis from observation and analysis of innovative or unusual uses of technology, to an investigation into the everyday use of technology in university teaching, and what shapes teaching practice. The assumptions that have guided my approach are in order to understand the real use of technology in teaching it is necessary to examine the everyday world of the university (Eisner & Peshkin, 1990, p. 99) and then to ‘tell it as it is’.

## **SECTION 1: CLARIFYING THE PROBLEM AND SETTING THE CONTEXT**

### My personal context

The study took place in a post 1992 university. The logic of this is practical because it is my place of work as an academic with responsibility for an MA programme, and it is my experiences of the use of e-learning for the design and delivery of this programme and other courses along with other aspects of my role that provide the motivation and justification for this journey of inquiry.

The MA programme that I lead, began in 2005, and was originally seen, by academics in the university and employers, to be innovative in that I designed it to be delivered in a way that maximises flexibility in order to meet the needs of students employed as health professionals in a variety of health and social care contexts. The teaching strategy of the programme employs a number of approaches to delivery, but a fundamental approach is the use of a blended design to teaching through the use of technology, in particular, the organisational virtual learning environment – Web CT, the use of which has evolved and developed over the life of the programme. There is a variety of reasons for such an approach, but it is mainly shaped by the practical needs of the students, who tend to be women, with families and very active, professional lives, and the ability to access teaching materials asynchronously and flexibly has been a selling point for what is now an established programme.

However, this approach to teaching and the inherent use of technology is no longer considered by academics, or the students involved in the programme, to be innovative or

different but normal and every day. My experience over this time is that rather than developing and expanding the role of technology in teaching, debate in the programme team has increasingly turned to concerns about the use of technology and problems and barriers to learning and interaction between students and themselves. In fact there is a steady reduction in the use of the VLE for the purposes of interaction, and an increasing use of the VLE as a repository for lecture notes and reading material, whilst at the same time there is a growing amount of time given over to face to face meetings and interaction. This gradual change in teaching strategy seemed to be shaped by the needs of both students and academics. Discussion with students (Jump, Jump, & Gill, 2009) revealed a complex learning environment for students on the MA programme, which included their professional working environments, as well as their social networks as professionals and students. The VLE, whilst considered to be a valuable resource for the academic team, was seen to be a small component in that diverse learning environment by the students. Reflecting upon these findings prompted me to consider the views of students from other courses that I had designed quite specifically to include the use of technology and the Internet in the teaching strategy.

A qualitative evaluation of a particular academic skills course I had designed to include the use of blended learning, revealed that students were able to articulate the benefits of technology, and at the same time articulate difficulties in learning this way (Jump & Jump, 2006). Most of them felt that they lacked the confidence to learn so publicly and that trust between them, and their fellow students, was fragile, especially in activities that I had designed specifically to promote the sharing of ideas and perspectives in online discussion areas, something that I had seen as a gold standard in e-learning design. In another study (Jump, Jump, Gill, & Stacey, 2008) I aimed to explore and analyse student interaction when they participated in online discussions. Initially I had been keen to monitor the effect that the gender of the student had on interaction, however, in reality gender became a way of categorising styles of interaction (Wetherell, Taylor, & Yates, 2001 pp 127 - 131). This study was heavily influenced by the work of linguist Sue Herring and found that in activities designed specifically to foster collaboration and interaction, all students are more likely to take on a male writing style signified by a high number of instructional monologues rather than collaborative, interactive postings. This study challenged my basic belief that the Internet provides an open space that clearly promotes discussion, dialogue and interaction as I

realised that the main interaction taking place was, in fact, between the lecturer and the individual students as they sought feedback and reward.

My personal experiences and evaluation work contributed to a realization that I had assumed that the use of technology would readily motivate students to take control and ownership of ‘their’ virtual learning space. However, I found it very difficult to describe and analyse the pedagogy that I constructed in the virtual teaching spaces that I used every day and the impact that it had on the students. Technological deterministic discourse influenced my practice which led to a basic assumption that the introduction of computers, software and the Internet into teaching practice would surely enhance the student experience and learning. However, far from being the free and democratic space that I had intended, as the lecturer I appeared to lead interaction because of the structures of power inherent in my relationship with students.

As well as my role as programme leader of the MA, I also held a cross University position as a Learning Enhancement Coordinator (LEC) and, as a result, became involved in a number of technology based initiatives including an HEA funded Path Finder project that aimed to investigate the student experience of e-learning in the same institution. The role of LEC brought me into contact with colleagues who held the same role in different schools and discussion, meetings and conversation had given rise to the sharing of views and greater knowledge about the use of technology in teaching across the university. In particular, this highlighted the difficulties of reconciling the deterministic philosophy of technology use in teaching, as directed by HEFCE and university policies, and the practical difficulties of promoting innovation. This contrast between the theory of technology use and the realities of practice provided an interesting space that I felt warranted exploration and analysis. My involvement in the Pathfinder Project meant that I was very aware of an emerging research area of student experience of online teaching and learning and yet I was unaware of studies of lecturers every day experiences of using technology in their teaching.

My reflections left me with a puzzle; I had experienced a number of tensions that brought me to question my practice as an academic and a desire to try to understand how technology use

in teaching is constructed and influenced by everyday experiences which led me to the question that I now set out to answer.

### Defining technology and e-learning:

For the purpose of this thesis I refer to **technology** as computers and the internet plus a variety of hardware and web based software that are designed to support person to person or person to information interaction in a context of teaching and learning. E-learning is the term most commonly used when referring to learning that is facilitated via information and communications technology (ICT), and tends to include approaches and processes which are web based or computer based and includes an array of digital tools, as listed below.

**Blogs** - also known as Web logs, these allow students to post thoughts and updates about their studies on the Web.

**Wikis** - sites like Wikipedia and others enable students from any location, to add and update online content.

**Social networking** - sites like Facebook, and MySpace allow students to build and customize their own profiles and communicate with other students.

**Web applications** - a broad range of applications that make it possible for students to use the internet, including web browsers such as Firefox, email programmes and word processors, plus games and other utilities

**VLE – Virtual Learning Environment**, A VLE is a virtual classroom that allows teachers and students to communicate with each other online. Class information, learning materials, and assignments are provided via the Web.

**Personal response systems** – are part of a group of electronic, interactive teaching tools, (in this case to allow students to respond collectively for example, to MCQ's or to vote) meant for classroom use, other examples include interactive whiteboards and visualisers.

**PDA - Personal Digital Assistant**. These are small hand held electronic devices PDAs allow students to organize their schedule, take notes, do maths calculations, play games, write

memos, surf the Internet and send e-mail, smart phones such as i-phones are included in this category.

**Podcast** - The name "podcast" combines the terms iPod and broadcast into a single word. Podcasts are audio and video broadcasts, (such as lectures) that can be re-played on a computer or a portable music player such as an iPod.

### Defining technology in the context of University teaching:

Much has been written about the fundamental changes that technology could bring to teaching and learning, most importantly for this study, in bringing about changes in Higher Education, and the potential technology has to define different experiences for students. This is usually found in the context of a critique of the passive transmission of information in standard didactic teaching methods such as lectures and seminars and a vision of a more active and student-centred focus to teaching, with an emphasis on interactions, feedback and active learning. This began in the 90's when authors such as Diana Laurillard (1993) Betty Collis (1996) Badrul Khan (1997) and Tony Bates (1995) described how digital technology could provide the tools for networking and making connections with teachers, other students and the increasing amount of information and resources available via the Internet. They all described technology in a discourse of evolution, and saw a trajectory of progress towards rich learning environments in a global, democratic and interactive context (Khan, 1997 pp 5 - 10) facilitated by the increased use of computers and the internet.

Technology use in the University also mirrors changes in society as a whole and has aimed to run parallel to the technological trajectory of personal computer use and the resulting emphasis on active and interactive systems that the development of powerful micro-processors have allowed (Ceruzzi, 1999, pp. 64-86). There was an expectation, largely based upon a common-sense view of those changes that as the relationship between technology and teaching evolved there would be a step towards very much more effective teaching. Tyler (2001, p. 351) sums up the history of technology in education by discussing some of the very early hype about how computers could potentially transform teaching and learning, he describes hypertext-based learning as being seen to have the potential for creating an 'ideal

pedagogic device'. He explains why such an idea may have emerged by quoting Roland Barthes who describes hypertext language as an 'ideal text' and Jurgen Habermas who talks of an 'ideal speech situation'. Add to this notion that social networking can contribute to the 'ideal relationship' (Giddens, 2009) and it was not unreasonable to expect that digital technology in the form of computers, the Internet, and other forms of hard and software would soon become necessary artefacts in the day to day teaching practice of university lecturers.

This very encouraging but narrow view of the relationship between technology and the University relies upon a discourse of technological determinism, in other words that technology itself will affect the use of technology as a vehicle for much improved teaching and learning. Raising the status and quality of teaching has been a goal of HEFCE policy since the mid 90's (Gosling, 2004) resulting in a number of initiatives designed to improve teaching in higher education institutions, largely by encouraging change through funding mechanisms. For example the Teaching Quality Enhancement Fund as an initiative was designed to support the move to a mass university system (Gosling, 2004) which included the integration of technology into teaching as a key enhancement activity. Ring fenced funding was made available to universities if they submitted a teaching and learning strategy. The HEFCE 'E-Learning strategy' of 2005 also aimed to encourage change in teaching through the use of technology in teaching through extensive funding (HEFCE, HEFCE strategy for E-learning, 2005). Evaluations of these initiatives have found that whilst some change did occur, largely such initiatives provide relatively little pressure for change (Gosling, 2004) (Kirkwood, 2009) The reality is that in universities aspirations for the innovative use of technology have been central to teaching and learning strategies for some time but there is very little evidence of significant impact on teaching practice (Blin & Munro, 2008, Kirkwood, 2009).

Certainly technology is used ubiquitously; however this is not necessarily in a context of interaction and dialogue. It is more commonly used to add notes, timetables, instructions and worksheets into a VLE, such as WebCT, and that online activity is seen by lecturing staff to have questionable pedagogical value (Fanghanel, 2007). It is suggested (Hanson, 2009) that academic identity is changed by technology use and a lack of strong evidence that the earlier promises of the transformational nature of technology are being fulfilled is causing academics

to oppose its use, and strengthen their relationships with students through their face-to-face interactions.

What has emerged over time is a complex relationship between the use of technology and teaching in Universities, and research into e-learning practice consistently reveals this complexity. Trends in research findings show that technology use in teaching probably has as much to do with the activities of the academic in terms of their own preferences, disciplinary settings and the socio- cultural pressures upon them as having access to technological tools (Masterman & Vogel, 2007, p. 58). The overall aim of my inquiry therefore, was to build a clear and detailed account of technology use in the everyday teaching practice of academics in a university. The analysis of practice is set in a case study methodology in that the individual case studies of academics will be examined and described in order to construct a description of the university in the context of technology use.

### How is the use of technology shaped in the everyday teaching practice of academics in a university?

In order to answer this question two sub questions will direct the study, these are:

- What is recognized by academics to be teaching in the context of technology use?
- What is realized by academics as teaching in the context of technology use?

### Researching technology and teaching

The main aim of this study is to explore technology use in everyday teaching, in the boundaries of one post 1992 university, which by definition means confining the research to a context and to the activities of a group of academics as a way of understanding how technologies have brought about change to their teaching. The methodology is set in a critique of technological determinism and the assumption that technology alone can cause wide-spread changes to the way that education is delivered to students. There is already a great deal of evidence that students successfully influence the use of technology in teaching (Dziuban, Moskal, Bradford, Brophy-Ellison, & Groff, 2010 pp 56 – 71) through the use of satisfaction surveys and end of course evaluations, but there would seem to be very little



evidence about how academics affect the use of technology in their teaching. Case studies are routinely used by academics as a way of exploring a case of technology use in teaching by providing a detailed analysis of student responses in a specific situation. Case studies have thus become a valuable and commonly used methodology in order to investigate the impact of technology use by individual academics on their teaching (Lyons, 2009), mainly because there is a lack of comprehensive ethnographic studies or controlled trials (Selwyn & Oliver, 2011, p. 2). Case study research methodologies are increasingly selected by academics because of their ability to explore the pedagogic, technological and social impacts of teaching innovations, which can in turn be shared through professional journals (Lyons, 2009). Consequently, case studies that sit in a philosophy of social constructivism, that is that knowledge and learning are socially organised as a way of addressing real teaching problems (Muller, 2000) 'have become the most widely recognised position in e-learning research' (Conole & Oliver, 2007 p27).

Whilst case studies provide a number of benefits to the e-learning research field there are a number of inherent difficulties in relation to interpretation and application of findings. This largely relates to the fact that they are written by practitioners about their own work often with a lack of specified methodologies and therefore interpretation of results is very difficult (Conole & Oliver, 2007 p31). The quality of case studies is important, if they are constructed and written with sufficient rigor and are designed to facilitate analysis, they can be used to argue for theory testing or to provide a data set for examination by systematic analysis, in other words, collections of case studies can lead to meta surveys (Lyons, 2009). The trouble when reading case studies, set in social constructivism, also relates to a need for an understanding of the historical and socio cultural context in which they are found (Denzin & Lincoln, 2003, pp. 305 - 312). This inevitably leads to uncertainty in this field of research. Some argue that there is a need for shared knowledge and commonly agreed standards of research in the e-learning community whilst others argue that epistemological approaches with a structured ontological framework and their inherent grand narratives will close down the innovation and production that is required to move the field forward (Conole & Oliver, 2007 p29). This latter point leads to a philosophical argument that relates directly to a problem with any research that is based upon a socially constructed concept, that it leads to 'relativism' and a belief that knowledge is dependent upon the perspectives and interests of individuals and social groups and that all knowledge about educational practice should be

socially relevant. Knowledge and knowing become entangled in relativism (Young, 2008) which means that the place of epistemology is unclear and that research findings cannot ever be generalised.

My own position in this debate is that such views need to be reconciled. The educational field is, by definition, made up of a collection of relations, for example between teachers and students, between different types of knowledge, different discursive approaches all of which are embedded in an institutional structure and related to policy and political interests (Scott, 2000, p. 26). In order to understand the way that technology is used and how meaning is constructed in practice there is a need to understand the context of its use in terms of culture, and importantly, rules and power dynamics (Klein & Kleinman, 2002, Facer & Selwyn, 2010, pp. 34 - 35). This also includes how different responses are shaped by external structures that empower or constrain activity, suggesting the need for a realist, structured approach to research methodologies. Otherwise, a shared meaning to the development of teaching design may never be fully articulated, which will affect whether teaching actions are seen to be successful or otherwise. Therefore, there is a need to examine the structural conditions that influence the use of technology in teaching in universities, and, in order to achieve this, the thesis will draw upon the field specific theory described by Basil Bernstein.

### Basil Bernstein's theory of pedagogic discourse

Basil Bernstein's theory of pedagogic discourse provides a language of description, in particular a language that can be utilised to study variations in knowledge structures (Young, 2008, p. 212) that is a vertical knowledge structure which he equates to logical positivism and a horizontal knowledge structure which he relates to social constructivism. There are two additional concepts in this field specific theory that I have found particularly useful as a way of describing and analysing the complex case studies that contribute to this study which are the concepts of classification and framing.

The concept of classification refers to the relations between categories, or the division of labour in a certain knowledge structure, particularly in relation to boundaries. This may refer

to subject matter in different disciplines, for example between history and chemistry, or it may refer to boundaries between different groups based on gender, age and class etc. Classification refers to 'what' is being taught, the organisational structure and the positions of those involved in the processes. Strong classification refers to strong separation between categories, meaning that each category has its own defined character, its own voice and its own rules of internal relations whilst weak separation refers to a blurring of boundaries resulting in a less specialised discourse, less specialised identities and less specialised voices (Bernstein, 2000 p7).

Framing is about who controls what in relation to the selection, sequencing and pacing of communication, as well as the control over the social relations which make transmission of knowledge possible. There are two systems of rules controlled by framing – the rules of 'social order' and the rules of 'discursive order'. The rules of social order refer to the hierarchical relations and expectations about conduct, character and attitude. Rules of discursive order refer to control over pedagogic practice, when there is strong framing pedagogic practice is visible and the rules of conduct and instruction are clear to the student, and largely centre on the teacher. When framing is weak pedagogic practice is invisible and the rules of conduct and instruction are implied and largely centre on, but may not be visible to, the student (Bernstein, 2000 p12 - 13).

The concepts of classification and framing are at the heart of Bernstein's theory and provide a means for describing the links between the processes of learning for the student and the processes of power and control that are determined by organisational practices which define the roles of academics and students and identify pedagogic practice. Bernstein argues that any change in the classification and framing rules will affect the relationship between teaching and learning for students. In order to make sense of that connection he introduces the rules of recognition and realisation (Bernstein, 2000 p16 - 17).

In order to learn students need to share a common recognition rule which will familiarize them with the discipline, language and context of their studies. They must be able to understand that context and understand the essential features if they are to be able to

participate and communicate as part of their learning. If they do not share a common recognition rule they will probably remain silent or behave inappropriately. Changes in classification rules affect the power relations in the educational environment, which in turn affects the differing recognition rules amongst the students. However, even if students have the necessary recognition rules they may still be unable to communicate orally or to create appropriate written texts in that context (written text means anything that attracts evaluation). This is because they may be able to recognise the learning opportunities available to them but do not possess the realisation rules, and if they do not possess the realisation rules they cannot speak or write in the expected way. It is the values of framing that act on the realisation rules. The relationship between classification and framing rules and recognition and realisation rules provide a language capable of representing the rules of pedagogic practice in differing contexts (Bernstein, 2000 p16 - 18).

#### The university as a setting for the study

This study is set in a university that is organised into a number of schools; each following different disciplines, which are in turn constructed into what Bernstein calls 'regions'. Regions are the interface between disciplines and the external field of practice (Bernstein, 2000, p. 52), and in the case of the university, this includes the schools of Engineering, Science, Architecture, Business, Health and Social Care, Education, Computer and Mathematical Science, and Humanities. With more than 17,000 students, the university is spread across three campuses, 79% of those students undertaking undergraduate programmes and 21% taking post graduate programmes. The university attracts an ethnically diverse group of students as summarised in the following table:

<b>Ethnicity</b>	<b>% of Total</b>
Asian Other	6%
Bangladeshi	4%
Black African	16%
Black Caribbean	4%
Black Other	1%
Chinese	3%
Indian	9%
Mixed	4%
Pakistani	3%
White	44%
Other	2%
Not Given	4%

Table 1: Ethnicity of the student population as a percentage of the total enrolments for the year 2010 - 2011

The age ranges of students enrolled in the University in 2010 - 11 are such that under 21's make up 25% of total enrolments, 21 – 29 years make up 43%, 30 – 39 years make up 16% and over 40 is 16%, and in terms of gender - 52% female and 48% male.

Technology in teaching, at this university, is seen to incorporate the use of the university virtual learning environment or VLE by many academics, although from September 2011 this will change from Web CT to Moodle. The discourse of change is set in a context of a particular educational theory that is constructivism and social constructivism. In the

handbook circulated to all academic staff in the university Moodle, for instance, is described as a ‘software package for producing Internet-based courses and websites. It is a global development project designed to support a social constructionist framework of education.’ Constructivism is then described as: ‘people actively construct new knowledge as they interact with their environments’, and social constructivism is defined as ‘Social constructivism extends constructivism into social settings, wherein groups construct knowledge for one another, collaboratively creating a small group culture of shared artefacts with shared meanings.’ (University of Greenwich Moodle handbook 2011 p. 5).

As part of a Higher Education Academy funded Pathfinder Project, an electronic survey of student experience of e-learning was conducted in 2007, 2008, and 2009. The survey sought answers to specific detailed questions about the student experience of using technology whilst studying at the university; the results provide a valuable description of the university in terms of technology use by students. I shall concentrate on the findings from undergraduates as they made up the majority of the participants. The survey found that whilst the majority of undergraduate students at the university want to use the Internet as part of their study, this is most likely to take place at home rather than on campus. The amount of time studying in the library or on campus with the Internet generally decreases over the three years of an undergraduate degree programme, whilst studying with the Internet at home and in the work place increases. The most common use of technology by students is for the purpose of communication and email is consistently the most used method for communication with friends and family, other students and lecturing staff, with the mobile phone (voice and text) as a close second for all purposes except for contacting lecturing staff. Face book is popular for keeping in touch with fellow students, and for keeping in touch with family and friends, but is also used to plan learning tasks, and work with other students on learning tasks and as a way of asking for help from other students. Skype, MSN, My Space and You Tube are used very little for all purposes.

For social purposes, the preference for a particular communication technology remains constant across the three years of undergraduate study. Only email use for communicating with lecturers and for asking for help rises over the three years from 74% to 88% of students preferring this form of communication. In fact, when accessing support from lecturers email

is the only means of communication for this purpose. When communicating with other students in order to plan or to carry out a learning task then email use remains constant as does the mobile phone. However, Face book declines a little in the third year from 24% in the second year to 17% in the third year. Students at the university use a variety of online learning tools, most commonly used is Google (a search engine) for all learning activities that are done alone (82%) or with other students (76%) as well as collecting (89%) and managing information (67%), and the next most likely choices are the university portal, Wikipedia and online journals. The university VLE is used by all students but at much lower levels than the other tools listed, the social bookmarking site Del.icious is used very little by students.

Across the three years of an undergraduate programme Google use by students remains relatively constant for all learning activities, as does portal use and Wikipedia use fluctuates across the years. The use of online journals from the library online databases, however, steadily increases across the three years of study and in particular when used for gathering information and doing assessments.

This survey data is congruous with other surveys such as that undertaken by Pew Research Center's Internet & American Life Project (Zickuhr, 2010) and the Oxford University Institute survey of Internet use (Dutton, Helsper, & Gerber, 2009). Email and the use of search engines, in particular Google continue to be the corner stone of online activity, 85% of people in this country will go to the Internet first as a source of professional, university based or personal information (Dutton, Helsper, & Gerber, 2009). This suggests that students at the university are using technology in the same way that the general public use computers and the Internet. In other words as an environment the university would seem to be having very little impact, other than for e-journal access.

However, 90% of undergraduates agreed or strongly agreed that e-learning is an important part of their education here at the university, and this figure remains constant over the three years of their programme.

## **SECTION2: RESEARCH METHODOLOGY**

### Collecting data in the university

The approach to the study was to build upon the use of the case study methodology as a popular research strategy in the use of technology and teaching. The reason for choosing this methodology is because of the extent to which it is used when reporting changes to teaching through the use of technology by academics in universities. A case study is the chosen research design because the purpose of this study is to study a case in set and clear boundaries (Creswell, 1998), which may be temporal, geographical, organisational or institutional, in this case organisational boundaries will define the case study. However, if, case studies are to be of value, they should conform to a set of agreed specifications, for example Lyons, (2009) notes that:

The structure of a case study should follow a predictable design that invites analysis, and the text should provide specified data related to the focus of the case study. In addition, there should be ethical and professional protocols prescribed that quality marks the contribution (Lyons 2009 p31).

Quality marking for this study enhanced the validity of the design of the study. My intention was to aggregate collections of case studies (both published case studies in a literature review and those collected as part of this research study) as a way of searching for patterns and emerging themes called by some - the 'case survey method' (Schofield, 1990, p. 222). There are inherent difficulties when attempting to select several cases in that the study may lack the strength that is associated with one or a few case studies (Cresswell, 1998, p. 63). However, the university as an organisation provided the boundaries that defined the study and then selecting case studies from different academics across the university served to be useful in order to produce an in-depth representation of technology and teaching in the university. Collecting data for the purpose of case study analysis presented a number of challenges, and ethical approval and permission was sought to undertake the study here in the university, from the University Research Ethics Committee (UREC), which was granted. Sound, ethical practices were observed throughout the study as I had previously detailed in the application for ethical approval. The ethical issues that I identified as possible risks in this study were coercion and confidentiality, and biased interpretation of the interview data.



In order to address the issue of coercion I sent an information sheet to all potential participants, this explained the study in detail and included the list of questions that I would be referring to in the interview. Participants were asked to contact me again if they wished to become part of the study; reassurances were made that they could withdraw their contribution from the study at any time. All participants were asked to sign a consent form agreeing to participate in the study; this process encouraged them to consider the study, to ask questions and to express any concerns that they may have. The contact details of my two supervisors were clearly documented for this purpose. In order to address the issue of confidentiality I created pseudonyms for the participants in the final report, and wrote about their approach to teaching rather than providing extensive detail about their function in the university. All interviews were recorded and transcribed, the data was safely stored on two external memory drives (one for back up) and analysis of the data took place on my own computer at home. All participants were informed of the purpose of the study and that my intention is to disseminate the findings through appropriate academic channels. The difficulties of interpretation are addressed explicitly as part of the methodology section of the report where I explicitly address how the interview data was openly and clearly analysed through the use of a rigorous coding system and how my own interpretations were then intertwined with participant's quotations. This is discussed in greater depth on pages 23- 24 of the methodology section in chapter 1.

The process of data collection began with an analysis of the research and policy documents, the purpose of which was to achieve a much deeper understanding of the context in which the study is set, including:

- the importance of the study
- to begin answering the research question
- how the organisation is represented in a strategy document.

The results of this first stage of the study led to the design of the interview protocol and the recruitment of 13 academics from across the university as a source of interview data in order to answer the research question. The interviews were the main data source for the individual case studies. They were undertaken having provided each participant with guarantees of confidentiality and anonymity and aimed to question each academic about their use of

technology and what they thought it contributed to their teaching. The process of data collection is discussed in more detail later in this chapter.

The case study methodology that framed the design of this study required the collection of data from a number of sources in order to provide sources of evidence that contribute to answering the following research question,

**How is the use of technology shaped in the everyday teaching practice of academics in a university?**

In order to answer this question two sub questions directed the study, these are:

- What is recognised, by academics, to be teaching in the context of technology use?
- What is realised, by academics, as teaching in the context of technology use?

My own place of work, a post 1992 university, provided the site for the study, and the unit of analysis was different examples of teaching practice (using technology) of academics from across that university and from a variety of subject disciplines. I shall describe each stage of the study in more detail in this chapter and findings of the analysis can be found in:

- Literature review in chapter 2
- Analysis of the HEFCE strategy document in chapter 3
- Analysis of the individual interviews in chapter 4 and 5

**Methodology Stage 1 - documentary analysis**

The study used a combination of methodologies in order to construct the rich description necessary to investigate the complexity of the university as the context for the study as well as the actions of the individual academics. The study began with a review of a collection of published case studies of academics, from around the world, describing and analysing their use of technology in particular teaching situations. The methodology chosen to synthesise and analyse the selected case studies was a systematic analysis, a method that is directed by a highly specific question, a systematic and transparent process of searching the research databases and a review of the literature which is explicit and rigorous. In other words, the systematic review process is a key component of the inquiry process (Dowling & Brown, 2010 pp 13 - 16), and the main purpose of this systematic review was not to inform the study in a general, narrative sense but to place my case study in the empirical methods of

technology and university teaching case studies. The literature review is organised systematically for several reasons:

- The review provided evidence that this subject is worthy of investigation and by analysing the most relevant literature I was able to express the problem that underpins this thesis more clearly.
- The systematic approach provided a fruitful opportunity to review research that is set in the empirical setting of a case study methodology and to pilot and test the use of the chosen theoretical framework as a means of coding and analysis
- The systematic nature of the review provided a meta survey of actions of some academics in universities and as such the findings of the analysis contributed to answering the research question

Further literature is used throughout the thesis in order to examine the emerging themes more fully.

The second stage of the documentary analysis was to undertake a review of the Higher Education Funding Council for England (HEFCE) strategy document 'Enhancing Learning and Teaching through the use of Technology 2009'. The analysis attempted to identify and explain the message transmitted by HEFCE to universities about what is considered to be a worthwhile strategy in order to promote the use of technology in teaching and how the organisation is represented with that strategy. Bernstein states that an analysis of the official pedagogic discourse (official re-contextualising field - ORF), that is policies and strategies that are created by governments and its agents (in this case HEFCE), will help to establish the level of autonomy over pedagogic practice by the academics in a university (Bernstein, 2000 p33). Therefore, the results of this analysis are important and will provide a point of reference for the data collected through the interviews of academics. In order to verify its status as the most current document I emailed HEFCE in January 2011, the reply was:

'Nothing contradicts the Enhancing Learning and Teaching through the Use of Technology publication, the main thrust of which is that institutions should be treating this agenda strategically,.. '(A.Palmer@hefce.ac.uk: 25th Jan. 2011)

## Methodology Stage 2: Academic interviews:

The study used the interview as the main method for collecting data, the construction of which was informed by the methods associated with qualitative research that is semi structured interviews, guided by documentary analysis and set in a case study methodology. In conjunction, Bernstein's theory of pedagogic practice formed the basis of the analysis of the interview data, which included the categories of recognition and realisation, along with the concepts of classification and framing, However, the most influential guiding principle was to manage the process of the interview in order to facilitate productive interaction between myself and the interviewee (Dowling & Brown, 2010 p 81). A semi-structured interview was constructed; this included four parts, each part made up of a guiding question that aimed to provide a trigger for further communication about the topic. The questions were

1. What does teaching, in a general sense, mean to you?
2. How does technology affect your teaching?
3. Tell me about your thinking /decision making when you design teaching that includes the use of technology.

It would be very helpful if you could show me an example of a course or part of a course that has included the use of technology (that you have taught)

4. Would you describe yourself as a natural user of technology?

The objective of the questions was to obtain views about what the participants recognise as teaching through the use of technology and then how those views are realised in their practice. This allowed analysis of both the ideas that underpin their practice and the actual pedagogic practice as they are asked to discuss and show an actual example of teaching with technology. The concept of the relevant social group (Pinch & Bijker, 1984) (Bijker, 2010) helped to identify potential participants for the study. I wished to involve colleagues who were

- Enthusiasts in relation to the use of technology in teaching
- Experienced in its use
- Had contributed to the design of an online learning environment

- Were recognised in their school for their expertise in the use of technology

Prospective participants were asked to volunteer for the study by sending an open email to the Learning Enhancement group (LECs), and to a group of academics that made up the research group. Those who responded positively were sent further information in the way of a briefing sheet, the proposed interview questions and consent form (please see appendix 2). A total of 13 academics were interviewed. Participants were recruited to the study, therefore, because of their direct involvement in technology based teaching and their willingness to talk about it. The schools represented were:

School	No of participants
Education	3
Business	2
Science	2
Applied Professional Studies	1
Engineering	1
Health and Social Care	3
Humanities	1

Table 2: Participants in the study by School

I wished to interview each participant individually, which included a discussion about an actual example of teaching that included the use of technology, and therefore it was important that the participants were keen to share their ideas and were prepared to allow the interview to take place in their own setting. The physical setting of the interview was a place where the participants could safely share their experiences verbally and could show me an example of their use of technology; this involved having access to a computer and the internet.

The interview protocol was designed to provide a structure through the use of five open questions, but to encourage, in the context of the questions conversation and discussion, and

through the process of discussion construct a case study of an example of teaching with technology that they had designed. All interviews were recorded and transcribed. The individual case studies were then analysed in order to construct a view of the technological culture of the university (Bijker, 2010).

The answers given to the respective questions were analysed through a rigorous process of content analysis of the empirical data, which aimed to examine the relationship between participants theoretical views about teaching and the respective place of technology and then to what extent those ideas are realised in actual teaching through the analysis of the specific example that they chose to discuss. The sequence of coding is summarised in the following diagram:

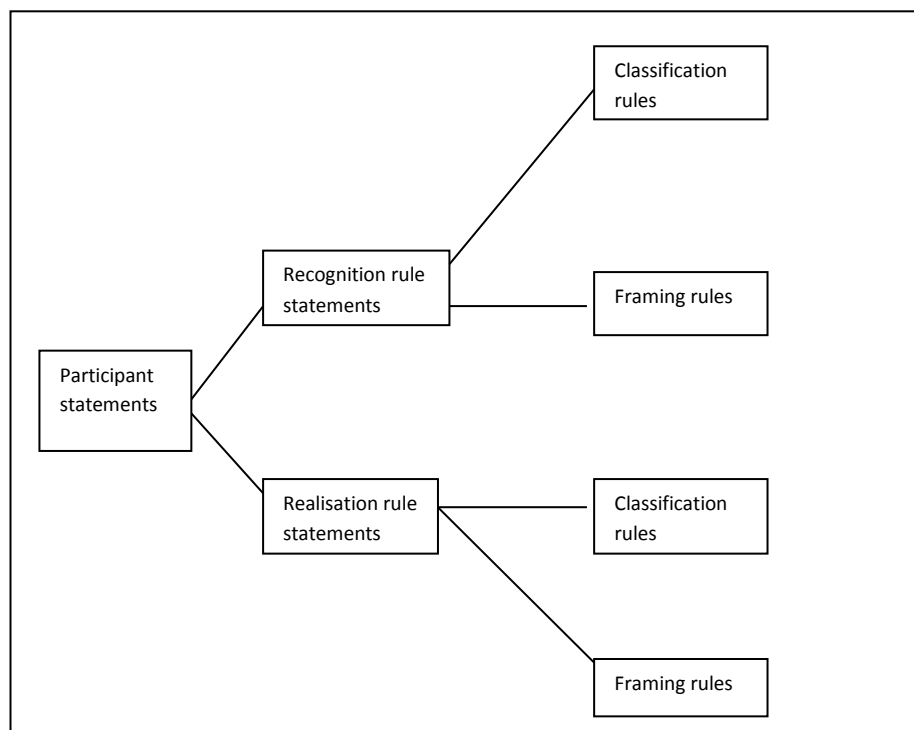


Figure 1: Diagrammatic representation of the coding sequence

Methodology Stage 3: Data analysis process

The interviews were analysed inductively through a process of coding (as above) and then the data was organised according to the language of Bernstein’s theoretical framework (Dowling & Brown, 2010). The first stage of the analysis attempted to identify the ideological conceptions of teaching held by each participant. The second stage then analysed how technology was seen to contribute to teaching and the third stage was to understand how

those views of technology in teaching are then realised in actual teaching practice. I drew upon the categories that Bernstein's theory (Bernstein, 2000) attaches to different forms of pedagogy although initially I was particularly anxious not to 'typologise' individual lecturers but to explore different approaches to teaching. However the context of each interview and resulting case study was dependent upon the context of each academic. Each academic was asked to share with me one instance of their use of technology and I accept that they may have chosen a different example to consider which may have presented an alternative approach to teaching, and therefore the resulting account may have been changed. However, this part of the interview followed the general discussion about beliefs about teaching and technology which created a context for a coherent debate. In order to establish a sense of openness to the analysis of the interviews and to engage with the difficulties inherent in 'insider research' such as this study, I have intertwined my comments in the reported statements of the participants, so that my interpretations and points of view are openly and clearly presented, as is the case that evolves through the process of analysis. All data was analysed sensitively and the identity of each academic is protected, the perceptions and practices revealed by them were then subjected to rigorous coding. Classification coding related to power over the content of what is taught and referred to the relationship between the discourses that made up the 'what' of teaching, for instance singular, academic, disciplinary knowledge would be coded as strong classification (CI +) whereas vocationally focussed knowledge such as that found in business studies or education studies would be coded as weak classification (CI -). The 'how' of teaching was coded by the framing rules and relates to control in teaching practice and coded as Framing ++, Framing + depending on the degree of control held by the academic over teaching, whereas control that is apparently held by students is coded as Framing - and Framing - - depending on the degree of control. This is summarised in the following table: (over)

CI+ refers to teaching that is tightly bound to the discipline with a strongly insulated body of knowledge. There is also a very clear boundary around the roles of academics and students, and the theoretical content of teaching has no obvious relationship to everyday language and experience. In this study this includes those who teach in the disciplines of Science, Engineering and Psychology (in the school of Health and Social Care)
CI- refers to teaching that includes disciplinary focussed knowledge that is set in a vocational context resulting in a weakly insulated body of knowledge that can be influenced by employers, professional bodies and politicians etc. The boundaries between academics and students are weakened and the content of teaching is applied to real world settings. In this study this includes those who teach in Education, Business studies, Health studies, Humanities and Applied Professional Studies
F++ refers to explicit control for the content, sequencing, pace and space of teaching held by the academic
F+ refers to some control for the content, sequencing, pace and space of teaching held by the academic
F- refers to some control for the content, sequencing, pace and space of teaching held by the student
F - - refers to greater control for the content, sequencing, pace and space of teaching held by the student

Table 3: Key to coding orientation

During the analysis, I considered the relations between:

- Academic and student
- Selection of content
- Sequencing of content
- Pacing of teaching
- Time and access to teaching

Finally I considered the context by which students are expected to give meaning to the ‘what’ of teaching, that is the recognition and realisation rules that students are expected to possess in order to produce the appropriate texts e.g. summative assignments. These included:

- The disciplinary context
- The personal development context
- Vocational focussed context
- Interdisciplinary context

I learned to use the coding system by reading a number of other studies found in the same theoretical framework of Basil Bernstein, all of which used the coding of classification and framing in a similar way, including the following: Morais, (2002), Morais & Rocha, (2000),



Ferreiria, Morais, & Neves, (2011), Geirdottir, (2011) and Sarakinioti, Tsatsarone, & Stamelos, (2011) as well as Bernstein's own descriptions of their definitions and conditions of use (Bernstein, 2000). The different sources of data collected as part of this study can be summarised as:



Figure 2: Representation of data collected as part of the study

### The structure of the thesis:

The purpose of this thesis is to explore the different conceptions of teaching held by academics in one university and the role that technology plays in their teaching practice. In chapter 2, I present the findings of the literature review which aimed to investigate, and analyse systematically, a series of published case studies of technology use in university teaching. The findings of the review are analysed using the codes and categories that make up Basil Bernstein's model of pedagogic practice, alongside the heuristics of the social construction of technology as described by Pinch and Bijker (1984). Chapter 3 aims to examine the messages that are conveyed by government policy (and its agents) in order to direct technology use in university teaching. The extent to which technology is seen by HEFCE as a device that is able to reformulate and transform teaching is discussed as well as the organisational structure and academic identities that are required to support this process. In chapters 4 and 5, I discuss the role of technology in the context of the university teachers' everyday teaching by presenting the findings of the interview data analysis. In chapter 4, I examine the ideas that the participants have about teaching and how technology fits into those perceptions and in chapter 5 I discuss the details of the case studies and the practice that make up examples of teaching with technology. The final chapter summarises the findings of all sections of the thesis. Insights that have emerged as a result of this inquiry will be discussed within the context of the original research question and the implications for policy construction considered.

## CHAPTER 2: THE LITERATURE REVIEW

### Summary of chapter content:

As I stated in chapter 1, the inquiry process will begin with an analysis of the literature. The purpose of this systematic review was to add to my current understanding of 'technology enhanced teaching' through a process of synthesis and analysis of a collection of contemporary case studies set in university contexts. The justification to review case studies in this literature review comes from Pincher and Bijker's concept of the social construction of technology (SCOT) as a way to structure the relationships between technological artefacts used in teaching and those social groups that are involved in their use. Basil Bernstein's sociological theory of pedagogy (2000) provided the framework for the analysis of the case studies. His concepts of 'classification', which examines power relations between categories, such as agencies, agents, discourses and practices, and 'framing' which examines the control of instruction in relation to the selection, sequence, pacing and evaluation of learning and determines the relationship between teachers and students, were used as instruments for the analysis of the systematically chosen case studies.

### **Introduction:**

The aim of this review is to explore the use of digital technology as a way of enhancing teaching in Universities. As a study it sets out to explore the relationships between University lecturers and technological artefacts such as computers, the internet and other forms of hardware and software that are used in the day to day management of their teaching. The study does not set out to explore those relationships in a context of purely distance (off campus) education, but in situations when technology is blended into traditional, on campus delivery as a way of enhancing teaching and learning.

One of the key methods of documenting how technology is successfully being used in University teaching is through published case studies, when university lecturers describe how they have used technology and evaluated the impact that it has had upon their students. These are often small scale, context dependent studies and whilst case studies make an important contribution to the literature it is difficult to extract the generic themes that emerge from them. The purpose of this systematic review is to add to current understanding of technology

enhanced teaching through a process of synthesis and analysis of a collection of contemporary case studies set in university teaching and learning.

The reason for the importance placed on these small context dependent case studies is best explained through the concept of SCOT or the Social Construction of Technology. In 1984 Pinch and Bijker (reviewed by Bijker 2010) argued that a social constructivist view of technology would provide a useful starting point for an analysis of the relationships between technological artefacts and those social groups that shape their use. Pinch and Bijker (1984) describe the development of technological artefacts using the evolutionary terms of 'variation' and 'selection', which results in multidirectional model of development, as opposed to a linear model. The essence of their argument is that such a multidirectional view is essential to a social constructivist analysis of technology, as the successful stages in the development trajectory are not the only ones.

Pincher and Bijker's 1984 paper offers a structure which includes four stages to the study of technology development, the first being interpretative flexibility. The authors suggest that there is flexibility in how people think and interpret the use of technological artefacts and how they use them in an everyday context. The second stage relates to defining and describing the relevant social group that is those who share expectations, needs and definitions and in turn come to a consensus that the artefact works. Artefacts are in turn 'selected' for further use, not because of empirical, objective indicators but because it works for that particular group. The third stage is 'closure and stabilisation' which is the point when the relevant social group decide that there are no further problems and that no further modifications to the design are necessary.

The fourth stage is 'the wider context', that is the socio-cultural and political context in which the technology development is taking place. According to Klein and Kleinman (2002) this stage is underdeveloped in Pincher and Bijker's original paper. They argue that in order to understand the relationship between technology and the social group it is also necessary to understand the group in terms of relations to each other, the rules ordering their interaction and factors contributing to differences in power. A theoretical framework is necessary, therefore, that will allow for lecturer and student relations to be analysed in response to the use of technology in traditional pedagogy, for the purpose of this study Basil Bernstein's sociological theory of pedagogy (2000) provided the framework for the analysis of the case studies.

### Bernstein's sociological theory of pedagogy:

Bernstein's model (2000) aims to 'describe the organizational, discursive and transmission practices in all pedagogic agencies and show the process whereby selective acquisition takes place'. He is most often remembered for his research into the effects of language use in education and the relationship between 'elaborate and restricted codes', social class and learning, however it is his concept of 'recontextualisation' that is most pertinent to this study. Bernstein described pedagogy as one discourse which embeds two discourses; these are instructional discourse, which is the specialist knowledge and skills of the subject being taught, and regulative discourse which determines the social order, relations and identity in a learning space. These two discourses are brought together for the purpose of transmission by the teacher and acquisition by the student. Bernstein described teachers as 'agents with a recontextualising function', who select, relocate, refocus subject matter for transmission. Like Pincher and Bijker he felt that the development of pedagogy, in terms of the selection of learning materials, the relationship to other disciplines and the sequence and pacing of learning are socially determined.

Bernstein developed two concepts as instruments to analyse the re contextualising rules of pedagogy – 'classification' which examines power relations between categories, such as agencies, agents, discourses and practices and 'framing' which examines the control of instruction in relation to the selection, sequence, pacing and evaluation of learning and determines the relationship between teachers and students. When there are clear boundaries between what is to be learned there is strong classification, whereas weak classification involves a blurring of the boundaries. Likewise when the instructional methods are centred on the lecturer there is strong framing and weak framing when methods are student centred.

Re contextualising rules offer a way of extending current understanding of the use of technology in Universities by adding the means to describe the relations between teachers, their students and technological artefacts used for teaching, and in turn, add to the under developed stage four of SCOT (Bijker, 2010) (Pinch & Bijker, 1984).

### Methodology:

The aim of the review was to synthesise and analyse small context specific case studies of the practice of using digital technologies by lecturers in their every day, on campus, teaching in Higher Education Institutions. As the studies collected for the study are from a very short

time frame (2007 – 2010) the study also aims to capture an evolutionary ‘snapshot’ of contemporary approaches to pedagogy in the context of technology and Universities.

For the purpose of the review the term digital technology will refer to computers and the internet plus a variety of hardware and web based software that are designed to support person to person or person to information interaction. A case study was defined as a published example of real people in real situations, and through the analysis of that specific example a more general principle could be extracted (Cohen, Manion, & Morrison, 2007). Establishing rigor by critical appraisal of each case study is difficult as the conventional tools available for other research methods were inappropriate, therefore the study is guided by the strengths and weaknesses of case studies identified by Cohen, Manion and Morrison (2007), in particular the need for rich description of the events relevant to the case, analysis of the events, perspectives of the teacher and rigor in the collection of student experiences. This latter point is key to understanding the social construction of the technological artefact, and in offering insight into the dynamics of all those involved.

The search for studies meeting the inclusion criteria began by searching bibliographic databases and registers of published educational research. Relevant articles that are included in the education database ERIC were searched and articles that met the inclusion criteria were found as full text articles using the database Swetswise. The following key words were used:

Technology, Higher Education, Teaching, Learning, Enhanced Teaching, Enhanced Learning and University.

Study titles and abstracts were reviewed before the article was included in the initial list. The articles that resulted from the initial searches were then screened using the inclusion and exclusion criteria before being included in the final list.

Inclusion criteria	Exclusion criteria
<p>Studies that include:</p> <ul style="list-style-type: none"> <li>• Any kind of digital technology that lecturers included to enhance existing, on campus, teaching methods</li> <li>• Evidence of practitioner based enquiry</li> <li>• Methods of evaluation to study the benefit to students, such as:</li> </ul> <p>Outcome evaluations including pre/ post test results, interviews, focus groups and surveys.</p> <p>Process evaluations including narrative analysis, observations, surveys, in depth interviews.</p> <ul style="list-style-type: none"> <li>• A publication date between 2007 - 10</li> </ul>	<p>Studies that are not:</p> <ul style="list-style-type: none"> <li>• A specific description of events set in a clearly detailed context</li> <li>• Focused on digital technology</li> <li>• Campus linked, that is the study excludes all case studies that document distance learning only</li> </ul> <p>Also:</p> <ul style="list-style-type: none"> <li>• Do not document the benefits to students</li> <li>• Older than 2007</li> <li>• Not written in the English language</li> </ul>

Table 4: Screening criteria as inclusion and exclusion criteria

A total of 16 articles (for the full list and the synthesis grid please see appendix 2) were finally accepted for the purposes of the review. A detailed thematic synthesis of the findings of the case studies was then conducted following principles for the analysis of qualitative data; this is in contrast to the Meta analysis of quantitative data that is also associated with systematic reviews. Study findings documented in each article were coded according to the theoretical framework described by Bernstein (1996) and then organized and documented as answers to the following questions:

- Why did the lecturers think that introducing digital technology would be useful?
- What did they aim for by introducing digital technology?
- What was the impact of using digital technology on the students?

## Results

Section 1: The themes that emerged from the analysis of the included studies suggested that there are reasons as to why a lecturer will choose to use technology in their teaching.

Weaken classification: A desire to remove or change the boundaries of power

This was highlighted in three studies which set out to transfer some of the power inherent in teaching and learning, held traditionally by lecturers, to their students. The studies identified in the context of this theme aimed to empower students by focusing the use of technology on the way that it could support their learning needs as well as delivering discipline specific content. The central feature of these studies was to break down conventional boundaries between students and academics in relation to communication and teaching practices as a way of determining the structuring of the learning space, which was quite specifically designed to improve the skills of the student.

For example, Lenne, Abel, Trigano, and Leblanc (2008) used an online learning environment that adapted to the emotive, cognitive and behavioural needs of the learners as a way of promoting self regulated learning. They set out to transfer power to the student in order to learn by increasing their involvement and responsibility during the learning process. Ng'ambi and Brown (2009) removed boundaries related to teacher and student roles, by designing an online environment in which students could anonymously post questions about course content and receive responses from both the lecturer and other students at any time. Allowing all students to contribute, including those who may find it difficult to ask questions and speak out in face to face situations was a particularly important consideration in the design of the environment.

In each of these studies there was a blurring of the boundaries between the everyday experience of the students and their university experiences. This involves a weakening of classification resulting in a pedagogic discourse that places an emphasis on realizing the competences that students already have, or thought to have (Ber96) . However expertise in terms of subject specific knowledge remained under the control of the lecturer.



Strong framing: keeping control of the content and pace of learning

Lenne et al (2008) state that ‘the course was designed based on the experience and evaluation methods provided by traditional teaching,’ and that self regulation and motivation determined the level to which students could exploit the resources made available to them. For Ng’ambi the initiative arose over a difficulty in providing support and attention to a large class of over 600 students. Questions about exam preparation were very popular by comparison with questions relating to career options and how to study. In another study (Demetriadis, Papadopoulos, Stamelos, & Fischer, 2008 ) which focused on case base learning in what the authors called an ‘ill structured domain’, scaffolding prompts in the form of questions generated by the lecturers were used to guide the learning process. They were used to direct the students and to engage them in deeper processing of information presented in their case-based course materials.

In each of these studies the lecturer was the expert and had knowledge and advice that the student must learn. Pedagogy, in this sense, was highly visible. The boundaries of power between the lecturer and the student have become weakened, in terms of supporting learning, whereas control of interaction in terms of the specialized knowledge, or the what is to be learned and evaluated remained firmly with the lecturer, or weak classification and strong framing (Bernstein 2000).

Strong classification and framing: lecturer centred teaching

In another group of the studies both power and control remained with the lecturer. A desire to improve student learning resulted in the lecturer enhancing their teaching by giving more teaching. This meant making teaching more intensive, more efficient, providing more resources or to increase the lecturer input through the addition of technology to their traditional teaching.

This included, for example, enhancing in-class lectures with weblogs (Shim & Guo, 2009) or adding a ‘blended’ component to traditional teaching in the form of a website (Delialioglu & Yildirim, 2008) which included a number of cognitive tools. In another study a Virtual Learning Environment (Shah and Cunningham, 2009) was introduced into an orthodontic training programme and to a Nurse Education programme (Mitchell et al 2007) in addition to other traditional teaching methods. Improving the efficiency of traditional teaching through

the use of technology was the intention of a number of studies. They included, for example, improving the efficiency of the traditional lecture through the use of video formatted lectures (Dey, Burn, & Gerdes, 2009) and offering a mix of power point and podcasts instead of lectures (Griffin and Thompson 2009).

The work of Ferenchick et al (2008) was to design a web based authoring tool for hand held computers (PDAs). This resulted in additional learning resources in the form of software, in order to support specific competencies for medical students (centred on specific problem areas e.g. Diabetes, substance abuse etc). The software was also intended to help the student to convert their learning from the PDA into safe patient care; in turn the software then tracked, documented and stored the student - patient interactions. The students used the device when on clinical placements in geographically remote places. Nagy-Shadman and Desrochers (2008) aimed to enhance student learning by increasing understanding, participation, alertness, and interactions with fellow students, through the use of Student Response Systems in the context of multiple choice questions in science classes.

In all of these studies there is a clear distinction between the role of the lecturer and the role of the student, and there is very little in the way of weakening of the boundaries between the everyday knowledge of the student and disciplinary knowledge of their University course. In each case the content to be delivered by technology and how it is to be evaluated is very clear to students and lecturers, a visible pedagogy (Bernstein 2000). The only boundary change is between home and university, with a view to facilitating study outside of a confined timetable.

#### Weak classification and framing: an integrated approach

Two other studies were designed to help students to integrate the knowledge gained at a lower level and move their understanding vertically and across a wider range of different phenomena (Bernstein 2000). Kraemer (2008) designed a course that emphasized student centred, engaging and active learning, and assisted the student to work towards enhanced proficiency of German language (language and reading) in a context of fairy tales that also increased the student's knowledge of broad sociological themes. Another study used technology as a way of enabling reflection, engaging with the creative processes and as a creative tool in dance education (Doughty, Francksen, Huxley, & Leach, 2008 ). An integrated approach aims to personalize the learning environment so that competence is explored in an individual and often therapeutic way. In pedagogies with strong framing

control is explicit and overt, as in the former studies, whereas for this style of pedagogy the control is implicit and hidden; Bernstein captures this distinction in his description of visible and invisible pedagogies. In the case of invisible pedagogies, students appear to have considerable control over the selection, sequence and pace of instructional discourse, and the boundaries between the roles and the power of lecturer and student are blurred.

**Section 2:** This section of the chapter will explore just what the studies described above aimed to achieve through the introduction of digital technology into teaching. By exploring how the lecturers involved in the studies determined the success of their actions it is possible to document their intentions in relation to benefitting students and their learning. Details of the findings of the evaluations will be analysed and discussed in section 3.

The majority of the studies documented an aim to satisfy students, and to improve learning or to change student learning behaviour, monitored through the use of automatically logged data. The majority of studies also used a combination of methods to assess how successful their initiative had been, as a way of capturing the complexity of those aims. Satisfaction was surveyed either in relation to the students' overall experience of learning through the use of technology, or of their perceptions of the effectiveness of the teaching tool. This involved survey tools (mainly likert style surveys) or interviews (two studies) in order to establish student views. Four studies aimed to improve learning and used pre and/or post testing to measure the improvement. Three studies explicitly aimed to change the behaviour of students and analyzed the data collected automatically by the teaching tool in order to observe for changes. One author undertook a detailed qualitative analysis of student posting to document intended and unintended student use of the learning environment, and one author also explored the student's epistemological beliefs, as well as a pre and post test of student learning, as a way of understanding student activity. In summary therefore the aim of lecturers when using technology to enhance their teaching is to improve student satisfaction, improve student learning and to mediate a change in student learning behaviour.

**Section 3:** In this section the findings from the evaluation methods used to explore the success of the initiatives will be discussed.

Student satisfaction

All of the studies but one that surveyed student perceptions about the use of technology in teaching reported positive findings. Three studies reported a significant level of support for future use of technology in their learning, including, 98% of the students in one study suggested that using a website to support learning should become a permanent resource for the course (Mitchell, Ryan, Carson, & McCain, 2007), and another suggested that the use of a virtual learning environment should be a mandatory component of their learning (Shah & Cunningham, 2009), and in another study two thirds of the students reported that technology increased their enjoyment of learning (Farah & Maybury, 2009). This seemed to relate to the students' expectations about the use of technology and the breaking down of boundaries between on campus and off campus teaching and learning. The one study (Delialioglu & Yildirim, 2008) that did not support the others in terms of increased satisfaction because of the use of technology found that in their controlled experiment (blended vs. traditional teaching methods) there was no difference between the groups in that they both reported high levels of satisfaction, which confirmed the views of the authors that both methods of delivery could be used inter-changeably without any direct impact on student satisfaction.

Most studies reported that students saw certain components of learning using technology more positively than others. This included things such as having access to helpful and up to date information, being able to access tools that allow for cognitive development, flexibility of access and the ability to use resources that included multiple representations of concepts and topics including texts, images and sounds. The theme that emerges in these studies, however, that has most effect on student views is the involvement of the lecturer, particularly in relation to feedback. Judgment on their performance or prompts to direct them to explore new knowledge domains, along with the use of immediate feedback in the classroom using tools such as student response systems, were the techniques that were received most positively by students. In these studies a combination of weak classification and the shifting of power to students set alongside strong framing and the lecturers control of what is to be learned and how learning is to be evaluated contributed to student satisfaction.

There are caveats to these findings which suggest that the factors that affect learning are complex. Two studies (Shim & Guo, 2009) and (Shah & Cunningham, 2009) suggest that socialization into the use of digital technology is significant, and the more experience that students have of using technology in their learning, the more positive about it they become. Some studies recognized that not all their aims could be met; for example (Lenne, Abel, Trigano, & LeBlanc, 2008) and (Shah & Cunningham, 2009) social learning and the use of

bulletin boards and forums were not recognized by the learners as important to their learning. Two studies (Demetriadis, Papadopoulos, Stamelos, & Fischer, 2008 ) and (Kraemer, 2008) reported that, whilst the students acknowledged the benefits gained from the additional learning activities they found the experience to be tiring and reported negative feelings about the work load involved.

### Improved learning

A number of studies reported improved measures of learning in their students as a result of introducing digital technology. Two studies (Griiffin, Mitchell, & Thompson, 2009) and (Dey, Burn, & Gerdes, 2009) reported their use of alternative methods of delivering lectures and the latter study found that when students watched a video of a lecture their comprehension and recall of the lecture was significantly higher than those students who had attended the same lecture but the live version. The former study found that synchronizing a podcast with power point slides so that movement from one slide to another was out of the control of the student worked better in terms of student scores for learning then when the student could control the movement of the slides in relation to the podcast.

In both of these studies the presence of the lecturer was a significant feature. In the first study, the authors videoed a live lecture and then played this to students with a picture of the lecturer embedded in the presentation and then for some students presented the same lecture but without the embedded image, just the lecture slides and sound. The presence of the lecturer enhanced enjoyment but made no difference to recall or comprehension. It was also found that when comparing the live lecture with the videoed version of the same lecture, the students rated the live lecture as higher quality and believed that the lecturer made more sense, but scored significantly lower in terms of recall and comprehension than either of the other two videoed formats. In the podcasting and power point study the overall preference by the students was for a traditional lecture with a live lecturer.

In a study (Demetriadis, Papadopoulos, Stamelos, & Fischer, 2008 ) that documented a course that had previously allowed the students a lot of control over their learning in what the authors called an 'ill structured' online environment, it was found that adding scaffolding in the form of elaborate questions activated by the lecturer resulted in significantly higher scores in the post learning experience test.

Two studies failed to find a significant difference in the learning of their students. In one study (Delialioğlu & Yildirim, 2008) the authors compared blended learning as a method of course delivery, in that they designed a very detailed website which included additional resources which the students accessed independently, with traditional live lectures only as the main method of course delivery. In this case the students did not show any difference in their levels of achievement. The other study (Farah & Maybury, 2009) compared learners who accessed a virtual microscope and added resources in a virtual learning environment, with students who used a traditional light microscope in the university laboratory, and found no difference in post-test knowledge quizzes. Students reported that it had changed ‘how’ they learned but not necessarily ‘what’ they learned.

In all of these studies a combination of weakening classification and strong framing have changed the way that students learn but not necessarily what they have learned, Bernstein (1996) suggests that this happens when autonomy in relation to individual teaching practice and learning by the students, is determined by the external regulation of student performance.

#### Learning behaviour changes

Three studies evaluated their initiatives through qualitative methods. In one study (NgAmbi & Brown, 2009) the authors analysed the postings made by the students in a website designed to encourage anonymous questions to the course lecturers any time, by text or email. They found that the site had supported the intended aims of the project in that students engaged with their learning actively and articulately but that there were also unintentional findings as well. The site became a place for ongoing, formative evaluation of the course. Lecturers received immediate feedback about their teaching and administrative skills and students took control of all aspects of feedback both in terms of their questions and in their feedback to the course team. However that feedback did result in some abusive messages about lecturers and other students from a minority of students. This study suggests a weakening of power in relation to the relationship between students and lecturers created the conditions for students to take control of their learning experience.

Focus groups were used in two other studies. In one (Shah & Cunningham, 2009) the students were asked for their views generally, about the addition of VLE’s into their learning. The authors report that students acknowledge that they would need to be more responsible for their learning, but it is the collaboration of lecturers and students that will determine the

power of the VLE as a learning resource. They also felt that the VLE could not be substituted completely for the teaching process. Problems of inequality for some students, relating to the cost of printing of learning materials from a VLE and the difficulty of coping with limited IT skills, were reported in one study (Mitchell, Ryan, Carson, & McCain, 2007) as reasons for not engaging with a website explicitly designed to reduce inequality through the use of digital technology.

Analysing the data that is automatically logged by the computer was another way of assessing the impact of technology on the learning behaviour of students in the studies. These results show that different students access the website more or less frequently than others, but complex patterns of use of resources in terms of individual problem solving are evident for some students. However in a study (Ferenchick, Fetters, & Carse, 2008) designed to support medical students out on clinical placement it was found that the students were more influenced by the formative assessment of their knowledge than the skills needed to solve clinical problems that they faced with patients. Again the strongly framed rules of evaluation were powerful determinants of student's behaviour.

#### In conclusion:

The findings of this review suggest that the success of pedagogic practice is more likely to be agreed between lecturers and students when boundaries between them are weakened leading to increased interaction, also when the boundaries between on campus resources and virtual learning environments are weakened also. However this is combined with a need for evaluation criteria for assessment tasks to be explicit and visible. Success for the students involved in the case studies was more likely to be reported by improved satisfaction through the use of technology than improved learning, or changes in learning behaviour. However, the success of technology in enhancing teaching in each case study was socially determined and the role that members of the significant group play in that process became clear through a systematic analysis.

Lecturers used technology as a way to reduce the naturally occurring power differences between lecturers and students by designing materials that allowed a sharing of knowledge through processes of active interaction, with the lecturer, other students and learning materials, as key components of the pedagogic discourse. A number of the studies aimed to

prove that structuring teaching in this way would improve student learning or encourage a greater level of independence in learning by the students. Despite the professionalism and competence of the lecturers involved, there appears to be an overwhelming similarity in the way that students respond to the use of technology as a part of their learning experiences. Bernstein offers a possible reason for such phenomena by explaining that alongside instructional discourse, regulative discourse is always part of the pedagogic discourse and is, in fact, the dominant discourse. All learning spaces are therefore a complex mix of instruction and rules, some explicit and some implicit, which determine the conduct and behaviour of students.

Instructional methods may become more efficient, more intense or more interactive, however the review suggests that whilst students may be able to recognise the various meanings that they are to take from their technology based learning, they still have to be able to convert these meanings into pedagogically recognisable texts, i.e. essays, projects and reports etc. that make up their assessment tasks (Singh, 2002). Bernstein calls this the realisation rules, and explains that students learn the realisation rules through their experiences of the social and moral order of the institution, and these become the regulative discourse that dominates the instructional discourse. Despite an expectation that technology will be incorporated into teaching, students seem to be rooted in a regulative framework that supports a strongly framed view of academic pedagogy and their subsequent actions.

SCOT or socio-technology (Pincher and Bijker 1984, Bijker 2010) offers a structure in the shape of case studies that will enrich the understanding of technology use in University teaching. The theoretical framework provided by Basil Bernstein's pedagogic codes of classification and framing has provided clarity and cohesion to the analysis and validates its use as part of the bigger study and analysis of interview data. What it suggests is that it is necessary to understand how the process of transforming learning materials into technology based pedagogic discourse also recontextualises the moral and social order of the institution. These findings confirm that it would be beneficial to explore the broader socio-political influences on lecturers; this would provide a deeper and richer understanding of pedagogic discourse set in a context of technology.

#### Limitations of the review:

Synthesizing the findings of the case studies for the purpose of this review has resulted in some interesting and useful findings that could support the work of individual lecturers and



policy development. However the process has also resulted in difficulties that prevent the use of empirical rigor normally associated with systematic reviews, including the meta-analysis of statistical data, which depended largely upon likert scores of satisfaction, and the synthesis of multiple evaluation methods other than through a narrative approach.

#### Personal reflections

I feel that this literature review has contributed to the answer to the research question as it explores the concepts of recognition and realisation rules, concepts that are important to the design of this study. Clearly there is a gap in relation to how technology is recognised by the academic and then realised by the student. I have also found that the classification and framing coding proved very useful to the analysis of the literature and have added to the analysis of them. This first stage of documentary analysis will now be added to by an analysis of the HEFCE 2009 strategy document 'Enhancing teaching and learning through the use of technology', as a way of exploring the rules and regulations that emerge from the strategy and the ideology that they represent.

### CHAPTER 3: AN ANALYSIS OF THE LATEST HEFCE E-LEARNING STRATEGY

#### Overview of the chapter content

The purpose of this chapter is to explore the way that technology use in university teaching has become an object of government policy through an analysis of the HEFCE strategy document ‘Enhancing Learning and Teaching through the use of Technology’ (HEFCE 2009). As stated in chapter one it is necessary to describe the context in which the organisational case study will rest, not just because of the chosen case study methodology but also because pedagogic discourse is generated by a re-contextualising discourse (Bernstein, 2000, p. 33) which presents a possibility for political and ideological influence. Such influence is highlighted in the literature review (chapter 2) which found that despite the professionalism and competence of the lecturers involved, there was overwhelming similarity in the way that students respond to the use of technology as a part of their learning experiences and the chapter concluded with the observation that all learning spaces are a complex mix of instruction and rules, some explicit and some implicit, which determine the conduct and behaviour of students.

According to Bernstein re-contextualisation involves the translation of different forms of knowledge into a teaching discourse (the Pedagogic Re-contextualising Field) (Bernstein, 2000, pp. 31 - 35), however this is controlled and limited by a regulative discourse, which affects the autonomy and identity of the re-contextualising agent, in this case the academic in the university. Whilst regulations that control teaching may emerge from the institution, the disciplinary field or from the local culture of the subject department, when the regulations are created politically then shifts in autonomy and professionalism of academics, along with subsequent changes to actual teaching practice in universities are likely to be linked to powerful drivers of change, such as alterations in funding and official scrutiny of practice.

Ball (2008, p. 101) suggests that the main aim of all educational policies is to present particular structures for organisations, and the inherent social relations and processes. As a result, education policies are unavoidably political and bring with them a number of

conditions that are inherently political in nature, which aim to change the value of practice in schools and universities, by providing a new language and a new set of rules, positions and identities. When the educational policy is set in a context of technology, however, the desire to effect a change and modernise the organisation becomes even more explicitly political (Winner, 1999, p. 29). This is because of the large-scale investment in the technology systems made by governments which makes them particularly interested in the response of the organisation to the respective policy (and investment). It is however, down to HEFCE as the funding council to steer the technology and teaching activities of the university according to the wishes of government (Filippakou, Salt, & Tapper, 2010). As a funding council, HEFCE is accountable to government but effective control is related to its funding flow to universities, until recently this amounted to 40% of the total income for universities, in theory making HEFCE a significant steering influence. HEFCE controls the activity of universities by regulatory processes promoted through mechanisms that are categorised as ‘transactional’ or ‘relational’ (Broadbent, Gallop, & Laughlin, 2010). Transactional steering mechanisms include funding, that is given quite specifically for, and attached to, projects and therefore includes an inherent contractual requirement. The 2005 HEFCE strategy for e-learning included a number of transactional steering mechanisms, financed by the collapse of the e-University, including the Benchmarking projects and the Pathfinder projects. Such mechanisms were designed to be seductive (Filippakou, Salt, & Tapper, 2010), involve ‘something for something’ in that agreed outputs and outcomes were part of the contract, be short term in nature but in reality had little impact on the long term integration of technology into university teaching (Glenaffric, 2008). The 2009 HEFCE strategy, that is the focus of analysis in this chapter, does not offer any additional funding flow for the purpose of technology and teaching but refers to the use of normal block funding for this purpose. The steer is now ‘relational’ (Broadbent, Gallop, & Laughlin, 2010) as technology becomes one of a range of activities, direction to universities becomes less specific about how the money is spent and is guided by a regulatory relationship based upon processes and procedures rather than outcomes and outputs. Since 2008 and the ‘New Accountability Framework’ HEFCE has been committed to reduce the regulatory burden on universities who are encouraged to adopt HEFCE guidance for good practice through self-regulatory processes and defined times for institutional audit. The effects of such approaches are expected to be realised in the long term and are less likely to result in immediately measurable gains.

Therefore the purpose of this chapter is to examine this latest HEFCE strategy ‘Enhancing Learning and Teaching through the use of Technology’ (HEFCE 2009) and to examine its potential to steer the university according to government wishes, and in particular provide direction to the individual academic.

#### Methodology:

This chapter aims to examine the detail of the updated strategy document with a focus on the relationships between HEFCE and the university and then to consider just what this means at a local level for the actions of academics. The analysis will be undertaken in the context of the conceptual framework of Basil Bernstein and will make particular use of the concepts of ‘classification and framing’ as a way of revealing how political and cultural power relations are constructed in the text of the document, with a view to exploring structures and relationships that are seen to be required to support the use of technology in universities. The analysis will aim to answer the following question:

- What are the organisational conditions required by technology in support of teaching and learning?

The rationale for this question is that in order to examine the use of technology in organisations it is necessary to consider the relationships of the social and economic culture of the organisation as it is this that will shape the use of technology (Winner, 1999, pp. 28 - 30). Of particular importance will be the way that the components link in order to promote discrete structures and relationships, which will not require a detailed linguistic analysis, but will emerge as a result of an understanding of the specific context that the HEFCE 2009 strategy is intended to apply. The assumption underpinning the analysis is that the text alone makes no sense but does when read in the context of a particular situation and in the context of other relevant texts (e.g. other policies and reports). Therefore, the analysis will emphasise the functional aspect of the text (Wodak & Krzyzanowski, 2008, pp. 8 - 9).

The intention is that the disciplinary specific conceptual framework of Basil Bernstein will provide a framework for the analysis so that different perspectives will occur and take into account both the inter-textual and the inter-discursive relationships between the components of the document and the organisational context (Wodak & Krzyzanowski, 2008, pp. 8 - 9).

Results of the analysis:

### **Enhancing learning and teaching through the use of technology, HEFCE 2009: an overview**

The HEFCE 2009 strategy gives a detailed explanation of how it builds upon the last 2005 strategy; it also provides a detailed description of how technology can be used to ‘enhance learning and teaching’. The 2005 document provided details about how HEFCE planned to help universities to embed technology through processes of funding, research and partnership working, and set out the mechanisms for establishing Centres of Excellence in Teaching and Learning and Lifelong Learning Networks, expansion of the National Teaching Fellowship scheme plus enhanced roles for JISC and the HEA, thus proposing a set of organisational structures that aimed to promote the idea that education in universities could be reformed if viewed from a new perspective. The key message from HEFCE was that it was ‘committed to fully embedding e-learning in a sustainable way in the next 10 years’ (HEFCE, 2005). Universities were constructed as willing recipients of a detailed and complex set of actions by HEFCE, JISC and the HEA in support of them, along with a great deal of funding, and an urgent need for ‘innovation’ in teaching and learning. Later however, one of the criticisms of the 2005 HEFCE e-learning strategy was that it communicated a strong sense of technological determinism and separated technology strategies from teaching and learning strategies (Glenaffric, 2008); therefore, the 2009 strategy document promoted a convergence of technology with learning, teaching and assessment.

It is important not to create fixed definitions (of e-learning), but instead to look to encompass the many uses of ICT that individual universities and colleges decide to adopt in their learning and teaching missions. (HEFCE 2009 para32)

The 2009 document reflects a particular approach to teaching, in that the title ‘Enhancing learning and teaching’ uses a metaphor routinely found in educational discourse, which, based on word order, suggests that education should be defined in the context of constructivism. The emphasis in education is placed directly on the activities of the student in the processes of learning with reduced prominence given to teaching. This reflects a dominant ideology in much of the literature relating to lifelong learning and to online teaching, all of which construct the student and a specific set of ‘skills’ as key to personal and economic prosperity. The document was written in the context of a range of other documents

that aim to coordinate the activities of universities such as the 2009 UNESCO report, Higher Education, Research, Innovation: Changing Dynamics (Meek, Teichler, & Keaney, 2009), which explores the dynamics of a knowledge society and the role of teaching and research in universities whilst acknowledging the many challenges that universities face when linking research agendas and teaching and learning to this notion. The Bologna agreement and the Lisbon Strategy also make explicit reference to knowledge and economic development in the EU and the role of universities in preparing a future workforce.

This analysis explored how the HEFCE 2009 strategy promotes organisational change which is seen to be compatible with the enhanced use of technology as well as the different interpersonal relationships that are inherent in those changes. The strategy is constructed by addressing the use of technology from two perspectives, the first being ‘learning and teaching’ and the second being ‘investment’ and economics. Finally, there is suggested framework for institutions to guide their activities in relation to technology.

#### Organisational changes:

The document (HEFCE, 2009) begins by introducing a new relationship between its self and Universities in that it explains how this strategy aims to draw upon the 2005 strategy document

However, we have also taken the opportunity to reflect on how technology can support individual institutions in achieving some of their key strategic *aims*’ (HEFCE 2009 para 10)

The rationale for such reflection is explained to be as a result of work undertaken by (now abolished) BECTA and DIUS which has

Highlighted some important areas where higher education can more fully respond to changing competencies and expectations of students and contribute to overall government priorities (HEFCE 2009 para 11)

And it is through a process of ‘reflection and insight’ that there is to be a revised approach which includes

*...reflections on investing in learning technology and a framework that institutions may find useful when considering their own strategies... (HEFCE 2009 para 12)*

The introduction sets a tone for the document, firstly by identifying forces that are driving universities to change and adapt to student needs and government policies and secondly by moderating the prescriptive tone. The introduction makes a case for a much more strategic

approach to technology by individual universities with an emphasis on strengthening boundaries between HEFCE and the university:

We published strategic objectives and an implementation framework in the 2005 HEFCE strategy for e-learning. These were primarily focused on areas of activity for HEFCE, the Academy and the JISC. Although they remain valid as areas of focus for the entire sector, we think it is more appropriate now to concentrate on where institutions might wish to direct their attention. (HEFCE 2009 para46)

HEFCE along with the JISC and the HEA are constructed as a group of autonomous organisations who have a role as executor of government policy, which involves activities that fall in three main categories, the first is setting tasks for the University to accomplish;

This framework is designed to help identify priorities for development. The implementation framework is designed to be flexible and we anticipate that institutions will adapt to suit their own needs. In order to plan effectively for enhancement, institutions will need to translate these into specific goals, development pathways and measures of success. (HEFCE 2009 para48)

The second is to control the allocation of resources to Universities so that it can accomplish those tasks:

We believe that that the importance of using technology to enhance learning and teaching is such that institutions will need to consider this a strategic priority when making investment decisions. Recurrent and capital funding in the block grant to institutions can be used to support these developments and we would expect institutions to consider the ability of technology to support the enhancement of learning and teaching when considering how to allocate these funds. (HEFCE 2009 para36)

And the third is to show an interest in the governing of the accomplishment of those tasks:

The Quality Assurance Agency for Higher Education (QAA) will offer support through the Academic Infrastructure, in particular, the Code of Practice. Section 2 refers to the use of e-learning in the context of partnerships and distance learning. *The QAA will continue to publish papers in its 'Outcomes from audit' series that will reflect on progress in institutional practice and share this across the sector.* (HEFCE 2009 para44)

The relationship may be considered to be an agency relationship; the government (in the form of HEFCE) is the principle and the university the agent, in that all the essential conditions are present. This in turn gives rise to a possible set of assumptions based on mistrust, control and compliance (Kivisto, 2008) which emphasises the strongly framed approach to the use of technology for universities.

## Constructing roles in Universities

Universities which are referred to as ‘institutions’ are constructed in the strategy as having a problem, referred to as challenges, for which there is a need for a permanent solution. Senior management (in the institutions) are constructed as ‘non-knowers’ as opposed to ‘knowers’

Senior management teams obviously play key roles – both in increasing their own knowledge and understanding of the direction and use of technology, and in championing this amongst staff (HEFCE 2009 para39)

giving a sense that managers are untrained in this field and need to take a more active role in promoting technology in teaching. Lecturers and academics in the institutions are referred to as ‘staff’ and constructed as agents who need to be taught about technology in teaching before it can become part of their everyday activity.

We anticipate that institutions would wish to consider staff development to support investment in technology. Strong pedagogical skills will enable staff to make good use of ICT and other resources to support student learning, and to be better placed to revise approaches as technologies change. (HEFCE 2009 para39)

This suggests that there is a need for division of labour based upon a hierarchy not just of HEFCE, the JISC and the HEA in relation to the Universities, but in the University also. Fuelled by schemes such as the National Teaching Fellow scheme, TQEF funding schemes and learning enhancement activity, academic staff have often emerged as champions of e-learning in their department or school. However this approach seems to be in question and a new proposed organisational approach to technology is summed up in this paragraph:

In particular, it (Phase 2 of the Bench Marking exercise) highlights the need for a periodic and in-depth institutional review of the use of technology, senior management support and strong central planning to align technology-enhanced learning with institutional policies and processes, a better understanding of costs and workload requirements (academic and support staff); and the challenge for institutions to move beyond pockets of innovative practice carried out by enthusiasts. (HEFCE 2009 para22)

The word enthusiast constructs the academic as someone with passion or zeal as opposed to expertise and direction is necessary in order to focus the work of academics, which is explained in the context of specific activities and for specific reasons. Changes to assessment are seen to be necessary for ‘efficiency and effectiveness’ reasons, firstly in relation to diagnostic and formative assessments:

A growing body of evidence indicates that well-designed and well-deployed diagnostic and formative e-assessments can foster more effective learning for a wider diversity of



learners. In addition, e-assessment offers a broader palette of digital tools for awarding bodies, developers and academic staff and enhances the process of reporting, storing and transferring data associated with public and internal assessments (HEFCE 2009 para38)

And into changing the working practice related to summative assessment and marking, suggesting that the relationship between academics and summative assessment can be altered through the use of technology:

Assessment is central to all learning and teaching practice. Effective use of e-assessment technologies can provide efficiency and effectiveness improvements in this practice. E-assessment is now widely used for summative assessment such as end of module tests. Much current use of e-assessment employs computer-marked, objective questions, with the main benefits of the technology being the immediacy of feedback to students and the reduction of marking for tutors. (HEFCE 2009 para37)

Constructivism is seen to be key to online teaching and in particular social constructivism

there is an opportunity for institutions to engage further with technologies with the intention of supporting learners in building knowledge collaboratively and engaging in social learning. Staff require support so they can effectively exploit the potential of these new technologies. (HEFCE 2009 para24)

The teaching of generic, inter-disciplinary skills is seen as particularly important:

Higher education, therefore, continues to have a unique role in providing learners with the higher-order skills of evaluation, critical analysis and reflection, synthesis, problem-solving, creativity and thinking across discipline boundaries. (HEFCE 2009 para23)

Students are constructed in this context as long term consumers of education, and the reference to reflection reinforces the importance of constructivism as a learning theory, in that, independently, they have the skills to analyse experience and then continually adapt and transform their conceptual meaning (Mezirow, 1990):

An increasing appetite for lifelong learning will lead to more and more learners needing to manage lifelong learning records. Effective use of technology will help learners to do this – providing links to formal qualifications, as well as the capacity to support reflection and help them in identifying appropriate new learning opportunities. (HEFCE 2009 para26)

They are also constructed as being technically ‘savvy’ and have particular expectations about their use of technology in the University, in particular a desire to access their learning remotely and flexibly

The 2008 survey of technology-enhanced learning for higher education in the UK by the Universities and Colleges Information Systems Association (UCISA) found that enhancing the quality of teaching and learning, and meeting student expectations, are the two most significant drivers for institutions to invest in new technologies. Improving access to learning for students off campus and for part-time students was also cited as important factors. (HEFCE 2009 para20)

as well as the different technologies that they use

Learners want and expect to be able to use their own devices in institutional contexts, and to personalise institutional services to meet their own requirements. This places new demands on ICT services. The 2008 UCISA survey also identified demands emerging over the last few years that are likely to impact on the provision of support for ICT, including streaming media, mobile computing and podcasting. (HEFCE 2009 para25)

In summary therefore roles are expected to change. There is a new role for management in the context of technology as they become what Bernstein calls ‘shaper, creators and designers of development and change’, and what Ball (2008) calls a ‘cipher for policy’. Academics become ‘repairers’ (Bernstein, 2001) with a role that aims to ‘diagnose and treat’ student needs in a context of efficiency and effectiveness. Students are constructed to be in a constant state of readiness for learning and anticipating their own needs, with a biological and psychological need for technology to support them.

### Economics:

As stated earlier the institution is constructed in a context of problems and challenges which are in need of a solution. Those challenges relate to a need to address the technological possibilities that computers and the internet bring to education. The problems are also set in a need for a closer relationship between universities and the workplace. The title for this section of the report is ‘a developing role for higher education in the workplace’ the inference being that this is evolving at present, and the reader is reminded of the content of the Leitch review of skills (2006). A lack of flexible curricula and delivery is seen to be impeding the relationship between universities and the workplace; technology is seen as the mechanism for providing the flexibility and efficiencies that are needed.

The Leitch review of skills further emphasises the responsibility that higher education has to provide high-level skills for the information economy, and to equip learners as workers and citizens in an information society. Increasingly, employers are demanding a real stake in curricula that may be delivered wholly or partly while learners are at work. Institutions need to initiate more agile processes of curriculum design and delivery, and are discovering that technology can provide the efficiencies and flexibility they need. (HEFCE 2009 para27)

One of the key aims of universities (stated in the document) is to ‘equip learners as workers and citizens in an information society’ and clearly this is seen by HEFCE as a source of tension between employers and universities. The inference from the document is that there is a need for employer contributions, both economically and educationally in relation to the content of the curriculum, to be more explicit in the processes of curriculum development and delivery.

The use of technology is also connected to the status of the university in the world and its ability to attract students from overseas. In this case the role of technology is to promote the flow of information from the universities to potential international students and back again and to give those students access to ‘better’ course material through the use of open educational resources. This will in turn assist with retention and recruitment of those students.

Effective use of technology is vital if we are to maintain the world-class provision of UK higher education. It can also help institutions in enhancing curriculum development and delivery, attracting overseas students, establishing campuses in other countries and in engaging with the Bologna process. Staff teaching an increasingly diverse student body will benefit from access to relevant information and resources. In addition, more flexible approaches offered by distance learning and open educational resources will give international learners access to better course information, and assist with the recruitment and retention of these learners. (HEFCE 2009 para28)

In summary, this section of the strategy document suggests that by detaching teaching and learning from the burden of engagement then education is instantaneously, and easily available in any place, at any time and any situation. This brings universities into direct relation with the economy through their own business activities of selling education overseas, and by constructing education in a way that supports the economic growth of external business organisations.

## Discussion

### Theme 1: technology and education

The key message from the strategy is that there is a need for a convergence of technology with all educational processes in universities, and this convergence is to be driven strategically.

According to Perez (2010) innovative technologies should have the capacity to bring ‘transformation across the board’. However, this is difficult in public organisations where there is ‘organisational inertia’. In the market economy, inertia is overcome by competition and all that this means, but this is not present in public institutions and historically they have lagged behind only changing when forced to respond to political pressures (Perez, 2010). Perez goes on to explain that there is a need for a techno-economic paradigm which sets out the most successful and profitable practices in relation to technology use and organisation structures, models of activity and strategy.

The notion of a techno-economic paradigm is not lost in the document in that the biggest section describes past investment by HEFCE in order to encourage developments in e-learning and technology use. Under the heading of ‘Investment’, the document deals with several issues, the first is that there will be no further investment from HEFCE in enhancement and that institutions will be expected to work in the boundaries of existing investment and, secondly, it will be up to the institution to consider how they will allocate their existing funds to support the enhancement of learning and teaching. Therefore, a key issue for universities will be efficiency, effectiveness and information flow, and these are situated directly in the day to day activity of the lecturers in the form of assessment, feedback and marking plus diagnostic and formative assessment processes. Institutions must now make strategic decisions about where best to channel activity and investment dependent on notions of cost and profit. The ability of computers to record information so easily makes the collection of information about students through diagnostic tests and formative and summative e-assessment remarkably easy, so providing data about the performance of different teaching and learning strategies in terms of efficiency and finance, and in so doing weakening the link to teaching as an autonomous, professional activity.

The reference in the document to staff development and the role of senior managers implies a concern with a broader range of issues, that is concerns about the institution its self and the limits that it will impose on the progress of innovation. Schumpeter’s 1911 ‘Theory of Economic Development’ (Prendergast, 2006) was one of the first to put technology at the heart of economic growth (Perez, 2010). The basis of this theory is the difficulties for agents in the workplace to change existing routines, and it is suggested that these difficulties fall into

three areas. The first relates to the risk of embarking on new projects when the outcome and consequences of the project are unknown. The second to the use of ‘habitualization’ by agents as a way of saving energy, and a lot of effort required to do things differently. The third is the social environment itself reacts against doing things differently. These obstacles to change create boundaries and hence senior managers and concepts of leadership are necessary for economic change (Prendergast, 2006) leadership is seen as a key component of change in the document.

The Leadership Foundation for Higher Education (LFHE) is working with JISC to investigate the extent of the integration of technology in institutional strategic planning and to raise the awareness of the role of technology in delivering strategy. (HEFCE 2009 para45)

The problems that a strategy that includes technology can help to solve include – problems of incomplete information and the limited capacity of human beings to process information, inefficient interactions between humans that result in increased transaction costs, as well as an uncontrolled mix of world views, ideas and ideologies that result in many perceptions about how things work, as well as uncertainty about economic performance (North, 1993).

## Theme 2: Technology and the Commodification of Education

The strategy makes an explicit link between the university, education and economics in a context of commodification, particularly in the context of the international student market. The move to marketization is not new ‘Universities are now irresistibly creatures of markets’ (Brown & Scott, 2009) as a result of the introduction of uncapped tuition fees for which universities are able to compete, along with the fact that there are incentives for universities to raise funds from private sources of income, the most lucrative of which is through international student fees.

The strategy infers that by detaching teaching and learning from the burden of engagement then education is instantaneously and easily available in any place, at any time and any situation. The function of technology in teaching should be constructed through processes of

competition and technological development and sold to businesses that constantly have to modify and change. The role of the university is to sell education capable of up skilling the workforce and it is the speed of learning that is the link to the success of economic change (North, 1993) and hence the need for flexibility and efficiency in order to meet the constantly changing demands of the workplace.

Another key purpose for developing the use of technology in universities is for the purposes of selling education to students overseas. In the past UK universities have been remarkably successful in recruiting international students and this activity provides 8% of average income to them (Cemmel & Bekhradnia, 2008). The success is largely based on the perceived prestige and quality of English universities and the fact that international students wish to study in English. However, competition from HEI's across Europe and the world is increasing which threatens English universities share of the international student fees. The competition relates to course fees, English universities are marketed as a 'premium product' and hence a 'premium price', but an increasing awareness that the demands made of UK students are less intensive than other countries', undergraduate and post graduate degrees are shorter here than other countries across Europe (Cemmel & Bekhradnia, 2008). The HEFCE 2009 report advocates that technology can play a role in providing information to prospective international students which will convince them that the University environments, resources and teaching and learning methods will compensate for the shorter study time but justify the high cost.

Technology is also seen as a tool that can be used to manage the inherent risk of high-tuition fees for home students and the HEFCE document suggests that the use of open education resources will reduce that risk

JISC and the Academy will jointly develop a series of pilots investigating the impact of open educational content on the sector. These will focus on three levels – subject, learner and institution – looking at how these approaches can enhance learning and teaching, and how they might change cultures to ensure the development of flexible, learner focused provision – supported by £5.7 million from HEFCE. (HEFCE 2009 para42)

Risk is a motivator of activity (Bernstein, 2001) as well as a possible inhibitor of activity, and technology is seen to provide a mechanism for managing risk. For the Universities it provides a way of marketing and selling themselves and for potential students a means of accessing high quality teaching materials, which remove the influence (and risk) presented by the actions of individual academics. This relates to the changed role of students as they become more demanding consumers of education because of the high level of investment they have made for their programme of study. As a result, complaints and the threat of legal action from international students are increasing (Swain, 2006). The report offers a way of reducing the risk of poor quality course materials through a strategy that supports the development of open course materials, something that HEFCE is prepared to invest £ 5.7 million in.

#### In conclusion:

In this chapter I set out to analyse the 2009 HEFCE strategy document ‘Enhancing Teaching and Learning through the use of Technology’ in order to answer the following question:

- What are the organisational conditions required by technology in support of teaching and learning?

The answer is found in a complex relationship between education and economics. It begins with a perceived need for a convergence between technology and teaching, learning and assessment because of changing student expectations of technology use and in relation to higher course fees, and how universities should adapt to such demands. The convergence is shaped by a need for universities to link technology use to accomplishing strategic goals, which is in turn linked to greater control from HEFCE, in relation to funding mechanisms and to QAA quality assurance systems. The document describes changing roles for HEFCE and the Academy from one of support for the individual institution to a new role that emphasises organisational change for the university; this necessitates a change of professional identity for both managers and academics.

The strategy is easily defined as neoliberal (Apple, 2009, pp. 174 - 175) in that it is centred on the links between technology and the economy and sets out a series of proposals that bring the academic into closer relations with employers. HEFCE also constructs the university

explicitly in a global market place with a need to compete for international students as a key source of income. In order to achieve these goals the university - and those working in it - is seen to be in need of transformation in order to become more efficient and competitive.

It is the transformed university and the way that it is described in the strategy document that provides the main part of the answer to the question. It describes a particular organisational structure in order to support the use of technology in teaching and to achieve the proposals set out in the final framework; this is a centralised, hierarchical organisation, structured by managerial systems of information flow and a diminishing autonomy for the individual academic. The academic is someone who responds to the strategy, rather than helping to shape it, and their role becomes marginalised with past experience and expertise no longer seen as relevant to the technologically-transformed university. Students are drawn into the market ideology through processes of lifelong learning captured in an e-portfolio, and in the expectation that this will inevitably lead to social and economic change.

There appears to be a difficulty, for HEFCE, when trying to define what pedagogy means particularly in relation to what academics should be doing with technology. In one sense the strategy argues that pedagogy joined with technology permeates every aspect of economic life for the university, as well as for society as a whole and for the individual student as future member of the work force, and yet fails to present a well-articulated framework upon which teaching could be based. Teaching and pedagogic discourse become invisible in the strategy and as result aspects of education become inconsistent and problematic. This is particularly relevant when considering the roles of those involved in controlling the content of future curricula as the strategy states that boundaries between the university and other stakeholders in the economy should be weakened and at the same time increasing amounts of control over the 'what and how' of learning given over to the student. The strategy refers to a society that is in perpetual instability, meaning that universities require systems that are highly responsive to the needs of students and the economy and there are several references to a need for constructivism as a guiding theory for pedagogy, meaning that there is a need to acknowledge the socio-historic context of individual students. At the same time it is suggested that HEFCE will invest in pre-prepared open education content which sets out to weaken the control that the university has over its own curriculum and strengthen control by the state. Diagnostic, formative and summative assessments are conflated and all require technology in order to



increase their objectivity and efficiency, which seems to greatly increase control over the 'what and how' in pre determined curricula, and something similar to the SATS systems in schools is proposed. It can be suggested therefore that the complexities of teaching and learning in universities are inconsistently addressed in the strategy, whereas the more straightforward processes inherent in a neoliberal model of institutional economics are much easier to articulate and therefore it is these ideas that dominate over pedagogy.

In the next stage of the study I interviewed academics, as I described in chapter 1, and this began the process of analysing how they recognise technology use in their teaching.

## CHAPTER 4: DATA ANALYSIS STAGE 1

### Overview of the chapter content:

The inquiry process so far, as reported in chapters 2 and 3, concentrated on the analysis of documents, firstly research literature as part of the literature review, as a result of which I felt confident that the research study was important. Also Bernstein's theoretical framework offers a language that I was able to use to analyse the pedagogic practice of academics when using technology. However, the analysis of the strategy document had revealed a lack of coherent language that adequately described the activities of academics in their everyday use of technology. This chapter therefore aims to report the findings of the analysis of the interviews undertaken with those who participated in the study, in order to do this, the perceptions about teaching in a very general sense are reported and analysed and views about how technology contributes to teaching. A number of studies in this field have suggested that there is a difference between what academics believe to be teaching and actual teaching practice (Samuelowicz & Bain, 2001) (Norton, Richardson, Hartley, Newstead, & Mayes, 2005), Bernstein refers to this as the recognition rules and the realisation rules, and in this chapter I aim to explore how technology in teaching is recognised by the participants in the study. In the next chapter (chapter 5) I shall explore how those beliefs are then realised into actual teaching practice.

### Introduction:

The analysis of the interviews presented in this chapter adds to the process of answering the research question through an exploration of the general beliefs about teaching held by the academics and how technology contributes to those beliefs. The resulting empirical data was coded and analysed as described in chapter 1 and as a result four themes emerged, these are:

- Knowledge and knower approaches to teaching
- Knowledge and skills for work
- Generic value system and dispositions
- The 'how' of teaching

Each theme will be presented as a mix of participant responses and my analysis in terms of views and interpretations are threaded through out.

### Theme one: Knowledge and knower modes of teaching

This first theme relates to how the participants see teaching, for some it is a highly visible activity, and they, as academics, are central to the teaching processes, both physically and in relation to their control over the content, space and pace of teaching. Whereas for others teaching is an invisible activity, in that teaching, and the resulting control that teachers have, is seen to be masked and where appropriate, devolved to students. Bernstein (2000 p81) refers to this as the knowledge mode of teaching with its inherently visible pedagogy and the knower mode with its reliance on an invisible pedagogy.

For five participants their physical presence in the teaching process is necessary

In a very general sense, teaching to me is imparting my experience and knowledge to some other individuals who are willing or able to listen (Daniel)

I just love sharing my knowledge and expertise in the area of sport, I just love it.(Eva)

So I mean it's really about imparting knowledge or helping students gain knowledge that will be useful to them in the future.(Sarah)

*Being able to break down something, your subject, topic doesn't matter what it is and to be able to communicate that so someone else who may not be of the same level of you can actually understand it. And if you can communicate your subject matter then I think you're quite successful at teaching. (Anna)*

For these academics teaching is an expert activity that is linked to a specific area of expertise and knowledge which is summed up neatly in the following extract

Say if you are an airline pilot, what sort of learning do you do? The learning experience is quite different in what that pilot might do or an engineer might do, or historian might, or an artist might do.(Ian)

The academic's own professional identity is key to the process of teaching and used to inform the teaching procedures and to structure the context in which the students experience that teaching

I worked in the NHS for several years [cross talks]. I like to utilize that sort of experience of real life... sort of scenarios and in teaching, and developing with things like problems and cases. We have a lot of situations that I've been exposed to and sort of trying to make various situations that are more real in the classrooms. (Daniel)

Now, I had people come and tell me that when people come to learn we shouldn't subject them to the same situation that happens in real life. That may be applicable in someone's course but not say in the case of the pilot because they need to feel what would happen if they lose all four engines on the aircraft (Ian)

I actually do something useful with it in the classroom and for themselves. You know anyone can learn how to do something but what will you do with it?(Sarah)

Whilst for eight participants in the study, teaching is much more about the actions, knowledge and attributes of students and their ability to construct and use knowledge

*And so, it's really about guiding the students through that and giving them... or not give them tools but help them to acquire the tools that they would need and also would be to properly research something in a balanced way and to be able to use that information.(Christopher)*

And teaching for me now is much more an active process of facilitating the students learning, so rather than imparting knowledge that I have, facilitating students developing their own knowledge. (Tom)

*It's about getting a belief and an understanding about learning and learning for them. And it's getting them yes we use the terms critically evaluating and what have you but it's actually to empower them like that(Claire)*

For these academics their own identity is constructed by their ability to work with students in this way, the following extract suggests that for this lecturer this involves a need to play down the power that tends to be symbolised by the term 'lecturer'

I mean, I call myself lecturer to distinguish me from other forms of teachers, a bit easier for me to say to somebody, "Look, I'm a lecturer and they realize that I am in a college or university. But, really I see myself as a tutor. (Jack)

And for this academic there is clearly a need to play down the contribution of teaching to the student's learning process,

And teaching for me now is much more an active process of facilitating the students learning, so rather than imparting knowledge that I have, facilitating students developing their own knowledge. Some of it might be, something some stuff that I could throw in, but I'm just a resource in that sort of process, now. (Jack)

the expected outcomes of this approach to teaching are articulated in the following extracts:

*it's not teaching standing there reciting facts that they we then test at the end it's actually us empowering them so I see us as facilitators and enablers (Tom)*

*So I don't believe that we teach as such. I don't think our education is about teaching. I think our education is about stimulating a desire to learn and that what we do in class is we I guide them to where they can, or where, hopefully to make them want to go and learn more. (Stella)*

*Helping to bring out knowledge in other people and whether that's new knowledge being shared with them for the first time or getting them to transfer their experiential learning and knowledge from other fields and bring it in.(Christopher)*

The extracts so far suggest that there are differing views about the boundaries between academics and students and the contribution that they each make to the transmission and construction of knowledge during the respective pedagogic processes. For one group of academics teaching is set in strong boundaries and power is held by the academic because their own knowledge and experience allows them to distribute a specialised body of knowledge through an explicit teaching process. Teaching for this group of academics is a very visible and tangible process. Whilst for another group the boundaries between themselves and the students are much more blurred with the aim of empowering students to find and share information through teaching processes that are less visible, and to extend their learning beyond their interactions with the academics.

#### Theme two: knowledge and skills for future work

The second theme to emerge was the need for teaching to be related to a future or current work environment of the student. For five participants this is an important aspect of their teaching, the following section explores how academics see the skills that are gained during study and their importance for a future vocational setting

This next extract supports and extends the view that preparation for work in teaching is vital for getting a job in the first instance

So when we come to our students, we need to look at the reality of going to work. Because at the end of the day they are coming and doing all these things, not just to enhance their knowledge but also to *earn a livelihood*. *So if you don't prepare them the right way, when are they going to go and learn these things? Because in the industry what's going to happen is that if you're not good enough, you won't get a job.*  
(Ian)

The next extract explains that a key aspect of teaching is to help students to manage the gap between the academic world of the university and the real world:

*In that they are not purely academic there's a real world practical side to it as well. There is no point in having, knowing something about a strategy if you're not able to relate that to the real world and actually execute it in the real world, so.* (Sarah)

And the following two extracts are specific examples of how that gap is managed through teaching processes

Especially in sexual health a lot of them because they think that sexual health means *infections and pregnancies and they might say well I don't know much about that at all. But then when they say well I'm working with old people and sometimes an elderly person might say they've got regrets that they didn't have sex when they were*

young or whatever. Then they realize that they do know a lot but they would never have given it a label. (Christopher)

*Actually, those things like, I was on call at 3 o'clock in the morning, I had two, RTAs come in, and I had to sort 80 units of blood out in half an hour. And what would you do, and I have to say that "Oh, you find an antibody of..." Yeah, and say, utilizing some other stuff that they would have heard of but I actually apply it to real life situations, and that's where that's a real point to the teaching. (Daniel)*

These extracts reflect the views that the boundaries between the classroom and the outside world of the working environment are blurred. The emphasis in these extracts is that teaching is not necessarily about the transmission of knowledge that is to be used by the students at the point of delivery, which is in the context of university based activities, but is part of an ongoing process of preparing the student for a specific vocational field. Knowledge is transformed through the processes of teaching in order to create a pedagogic discourse that is mediated and relocated to a new, and sometimes, imaginary site of application.

#### Theme three: a generic value system and disposition

Whilst not all participants made explicit reference to future work ,as above, the rest (bar two) made reference to the need for teaching to direct students towards a new set of values that will be important in the future, which is summed up neatly by one participant:

What's the most important thing about teaching is growth, learning, change (Mike)

The following extract suggests that changes in students' values are a key determinant of job satisfaction for academics

Now I get a big bounce from seeing students come in at the beginning of the program and seeing how different they are, not just academically but how different they are as people. Always professionals when they leave the program. (Tom)

In this next extract the participant attempts to articulate the link between teaching and the development of values in students, whilst at the same time, expressing the emotions that drive that process for her

it is interesting that distinction between turning out learners or the learned, I did begin very much content bound and here are my lecture notes all of that and I think one of the things that I have seen in my own development with growing confidence *and experience and just enjoyment of the process is that it's to do with learners it's to do with the joy of seeing people who want to learn, and who are interested in capturing that and helping them to extend it and seeing connections is a big part of me, helping to see connections with other disciplines, with their own experience, with contemporary culture sort of thing.(Rachel)*

The following participant describes confidence as a key attribute in order to develop other values and skills

*I try to give them the confidence to express their own abilities. It's not in life about knowing, it's about having the confidence to be able to say what they think or what they know (Stella)*

Others try to capture what it is that teaching should achieve in terms of values by giving a label to the activity

*I'm all after the self regulated learner that's me. As you know that's my raison d'etre. And teaching should enable that. Now any teaching that closes that down is problematic to me. So I think teaching should be opening up (Claire)*

Or it is seen as a specific teaching theory

*I mean there is a whole bit of concepts of adult learning where you know... you know not just teaching them anything for teaching sake but really how are they gonna apply and use it in the real world?(Sarah)*

And for this participant values are described with the context of a particular disposition

*I think at the heart really of where I am in terms of teaching is that I believe all learning involves risk. And I hadn't realized it at the time when I first thought about it but actually that's very bound up with constructivist theories and the risk is about allowing yourself to be in situations where you're prepared to have your constructs challenged and that's the risk that you may need to change your constructs.(Tony)*

The real benefit of developing those skills and values is summed up in this extract:

*I think that's really what you learn at universities. So, whatever subject you're doing, that may... will still help you in your career path are the core skills, obviously to do with the ability to keep abreast of information, understand it, appraise it and use it, you know, in an effective way.(Jack)*

These extracts propose a consensus of views between the all the participants, that teaching involves a great deal more than the instrumental processes that are associated with instruction and the transmission of a set body of knowledge. The extracts above all explore a set of criteria that describe what students should be doing in terms of character, manner and conduct, and this regulates and provides internal order to the instructional discourse. These two aspects of teaching, instructional discourse and regulative discourse (Bernstein, 2000 p34) are completely intertwined, the value systems that are transmitted through teaching may be directed towards preparing students for a future working environment or it may be about directing them towards a set of social rules that are inherent in a particular cultural context, in which teaching is situated.

#### Theme four: the 'how' of teaching

The final theme that emerges from this section of analysis refers to how teachers control and manage the teaching process. For those respondents who see teaching as an invisible activity there is an implied sense that the space where their teaching takes place is not controlled by them but the control is given over to the students themselves, this is summarised in the following extract:

*So I say to them well pretend you're in a classroom and when we have a discussion we'd all be expected to share things. Sometimes you have quiet people and we need to look at ways of encouraging them and all that. So they really get into that and even late last night they were talking to each other about submitting their assignments and whether they are gonna have a pizza or a bottle of champagne to relax and all and they've really used it as a good support for each other (Christopher)*

And for one teacher handing over the control of that space is a very important part of teaching:

*I used to be a sailor and one thing I realize by being a sailor is that, I was never in the same place twice. It was always fresh eyes ... and, it's exactly the same feeling when you're looking at academic stuff and people are going through, you know, and you're talking to other people and they're coming up with it. You know, they're challenging your ideas or asking what you think about something, or coming up with, you know, giving you some information that they've got that you didn't have. And for me, that's like the journey, that's like, you know, you've gone around another corner and you see a new vista or something like that. And then to me, it feels just like traveling to me. So, for me, that's quite exciting (Jack)*

Whilst for others teaching has to take place in a very specific place:

*And the beautiful thing about science is we also do laboratories. So it's not just about hammering knowledge into students is about applying it in the laboratory in tests and stuff and that makes it really sort of wholesome from here. (Eva)*

These different views are directly linked to whether an academic sees teaching as something that is visible or invisible, and the following academic manages the teaching space to encourage discursive activity (not the same as social discourse):

*I do is I very little talk and chalk. Don't like talk and chalk but I will do if I have to get some basic principles over but I like group work, I like to give students the opportunity to express their own opinions. I try to encourage them to say what they know rather than what they think in a structured environment so I find a lot of time you know manipulating groups and things to try and get those that are shier or not so*



used to or not so willing to put forward their ideas cause some I know have great things to say they just need some confidence to do it.(Stella)

A key part of managing teaching is through the evaluation processes and in particular summative assessment which is seen to be problematic by those from both the knowledge and the knower perspectives. For this first participant assessment puts unnecessary constraints upon learning by changing the purpose of teaching which in turn changes its value, the reference to bureaucracy suggests a concern with an official control of teaching:

What's not important about learning is assessment, we over assess and we have faith in assessment and our assessment time and again have proved to be wrong. Many people say that students won't do anything unless it's assessed. They aren't born that way we train them to do that we cannot blame them and it's our teaching that does that. So I'm very strong, teaching is about learning, it's not about assessment, assessment is the bureaucratic necessity that justifies funding. You think well okay fine you can't ignore bureaucracy but let's not worship it and let's not encourage the worship of it. (Mike)

Whilst the next extract suggests that assessment evaluates students cognitively but not necessarily in the social and cultural context of a vocational setting:

So people would complain. I have a certificate with a first class but I haven't got a job. The reason is probably you're getting it first class because the assessment is assessing you in a different field and they are not being subjected to the same sort of rigors as in real life. (Ian)

And the following two extracts suggest that the assessment procedures are not in line with contemporary perceptions about teaching:

*In the context of higher education specifically, teaching shouldn't just about imparting knowledge and them ticking boxes. (Tom)*

*And years ago was very much the, the preacher on the podium. I've got some knowledge in my head. My job is to get that knowledge from my head into your head and then test you in six months' time to see if you can remember it. (Tony)*

Assessment processes, for those interviewed, are seen as problematic for a variety of reasons, but the suggestion is, that whatever the views about teaching, the current assessment procedures do not link comfortably with any of them.

**In summary**, it is possible to group the views and perceptions of those interviewed about what teaching meant to them, into two possible approaches, that is the 'knowledge' mode of teaching and the 'knower' mode of teaching. Knowledge modes are linked to the relationship between teaching and epistemology whereas knower modes are linked to the relationship between teaching and social relations, (Maton 2000 p155)

Such descriptions of teaching are supported by others and whilst the actual names of the categories may vary, there is a consensus that two categories tend to emerge when investigating the conceptions of teaching by academics, and are useful when considering approaches to teaching. Prosser and Trigwell (1999, pp. 153-4) were the first authors to describe conceptions of teaching and learning as 'student centred' or 'teacher centred' and related the terms to the quality of teaching by linking such conceptions to deep and surface learning. The notion of quality of teaching also underpinned Entwistle's (Entwistle & Walker, 2000) dualist thinking that is that knowledge is either right or wrong, and in opposition there is a general move to relativism. The terms gradually became known as 'content centred' or 'learning centred' (Kember & Kwan, 2000) 'learning centred' or 'teacher centred' (Samuelowicz & Bain, 2001), or 'knowledge transmission' and 'learning transmission' (Norton, Richardson, Hartley, Newstead, & Mayes, 2005). Bernstein however refers to knowledge mode and knower mode, and rather than consider one category to have merit over the other he sets his argument in the context of the curriculum of mediaeval universities, that is the trivium and the quadrivium, and the importance of both forms of knowledge. The trivium came first (knower mode), with language, reasoning and the development of a particular form of consciousness studied in order to develop the inner self of the student. Next came the quadrivium (knowledge mode) which consisted of arithmetic, astrology, music and geometry, both were considered essential and always studied in this order. Bernstein describes the connections between the two forms of teaching, they were integrated in that knowledge was the outer expression of the inner, dedicated self, but they were also separate. There were the trivium teachers and there were quadrivium teachers, however the trivium dominated the university (Bernstein, 2000, pp. 82 - 88). This, Bernstein accepts, gives rise to a contradiction at the heart of teaching one that remains in the university today as reflected by the polarised conceptions of teaching that are consistently reported in the literature and found in the analysis of the interviews in this study.

The following table summarises the two modes as described by Bernstein (2000 p81 ) and each cell has been adapted to reflect the findings of the interview data analysis.

Knower mode	Knowledge mode
<p>Content:</p> <p>Weakened boundaries between different kinds of knowledge in teaching and ‘values’ development is orientated towards the practical aspects of study.</p> <p>Content relates to the development of the skills and attributes of students.</p>	<p>Teaching is defined by specific knowledge that relates to a specialised disciplinary/ vocational field and its practices, as does ‘values’ development.</p>
<p>Pedagogy:</p> <p>Pedagogy methods aim to diminish the control that teachers have over the teaching space and pace of delivery. Students are expected to be actively engaged in the education process.</p>	<p>Teaching is based upon traditional methods of transmission of pre specified knowledge, relying on methods such as lectures and laboratory work.</p> <p>Academics have control over the teaching space and methods of delivery.</p>
<p>Assessment</p> <p>Seen to be a point of conflict for academics.</p> <p>Set in the context of a set of values that are shaped by the local context.</p>	<p>Seen to be a point of conflict for academics.</p> <p>Traditional assessment of performance with reference to what is considered to be important for disciplinary/ vocational practice.</p>
<p>Identities</p> <p>Identity of academic orientated towards a local context and values of the job market. Weak boundaries between fields of academic knowledge and the skills required to participate in this form of teaching.</p>	<p>Professional identity defined by the orientation to the field of practice, but also strong engagement with the academic/disciplinary context.</p>
<p>Weak classification and weak framing – epistemological relations.</p> <p>Strong classification and strong framing – social relations.</p>	<p>Strong classification and strong framing – epistemological relations.</p> <p>Weak classification and weak framing – social relations.</p>

Table 5: ideological views of academics about pedagogic discourse

#### Personal reflections

I am eager not to suggest that all teaching at the university will fit neatly into one of the two modes but themes identified from the analysis of the interview data, above; do seem to reflect the work of others. However these two categories, set alongside a vocational or non vocational focus provide a useful context for discussing the contribution that technology makes to teaching.

## **SECTION 2: THE CONTRIBUTION OF TECHNOLOGY TO TEACHING**

In the second part of the interview I asked the participants, having now considered their views about teaching in a very general sense, to explain how they perceived that technology contributed to their teaching. During the interview and certainly during my analysis of the interviews, I discovered a change in the language chosen by the participants in order to answer the question. When talking about teaching generally the participants spoke about their beliefs in a theoretical and abstract way, whereas for this second question the participant's language became much more precise and context bound as they referred to specific incidences of technology use in their teaching. Analysis of the interview data therefore resulted in coding that referred to particular aspects of teaching practice and how technology contributed to that practice. The themes that emerged were:

- Discourse in teaching
- Pedagogic space
- Time
- Evaluation and control
- Limitations to academic autonomy

### **Theme 1: discourse in teaching**

For those academics who approached teaching in the 'knowledge mode', that is knowledge distributed in a very explicit and visible form of teaching, technology was seen to blur the boundaries between themselves and their students, and they used it to communicate with their students. This tended to centre upon everyday information - or mundane (rather than esoteric, i.e. theoretical and elaborate language (Bernstein, 2000, p. 157)) issues, outside of the formal settings of the lecture hall or laboratories, and for this academic this is seen as very helpful:

*It a godsend and it makes life in a way a lot easier and practical for the students, and I can reach via online systems all the students. That's really pretty magic (Eva)*

The next two extract reflects a view that technology can be used in order to direct and guide students automatically and systematically, to additional, explanatory material,

*It can be a sophisticated tool providing it's supported and providing it's laid down in a logical manner that other people can follow your logic. Cause really it's only a pointer to other bits of information. But if you point to things in a very convoluted way that puts people off. So you want to be able to map things out for other people in a way that they can actually, it's a bit like a road map, you've gotta have traffic lights*

*at certain points. You've got to have go to's and stop signs and point to places of interest so it's a bit like a road map. (Anna)*

And the following extract supports this use and applies the metaphor of the 'tom tom'.

So then the old days in learning, where you had to take out the maps and plan your routes and do all the work, and now you can switch on the tom tom, (Mike).

Communication for these academics (above) is one way that is from the academic to the students, the purpose of which is to add further structure to their already coherent and hierarchically structured teaching. The discourse is structured by the space offered to them by the use of technology, students are perceived as individuals in such communication as there is no necessity for structured social relations between them (Bernstein, 1999, p. 162), This form of discourse is referred to by Bernstein as 'vertical pedagogic discourse'

Whilst still set in a vertical discourse structure, for the next lecturer technology provides an opportunity for students to be exposed to a discourse that is situated in a future vocational setting, in order to break down the boundaries between the university setting and the 'real' world outside:

*e-learning can help us in a lot of ways, not just distance learning but a whole set of tools. One of the things is, how do we know what this manager does in the real world, like if you would consider that these young kids haven't worked (Ian)*

For the academic (above) pre-recorded communication from those who work in the field is very beneficial as it is this vocational context that helps to bring structure and cohesion to teaching. The intention is to help the student to understand the course content in relation to the vocational discipline and practice as a whole, in a real world that is seen as problematic rather than predictable (Prosser, Martin, Trigwell, Ramsden, & Lueckenhausen, 2005, p. 146)

Technology use in these cases means that boundaries between the academic and the student or university setting and vocational setting, are weakened by the use of a discursive space that is controlled by the academic, this vertical approach is summarised in the following extract:

*So you actually have to be there active, visible for students if you want them to actively engage with us as well. If you use this as a repository they'll see it as repository. So it just depends on your view and what the VLE is there for, what's the function of..? To me it's something that's a communication channel to students. It's not just a repository for getting materials. (Anna)*

The next set of extracts come from those participants whose teaching fits in the knower mode of teaching and what Bernstein describes as horizontal pedagogic discourse , and provides evidence that for some academics technology is used in teaching to open up a discursive space for students that extends beyond the classroom,

I thought about setting the website so that I can communicate with my students and say *“Look, I found this piece information that is really interesting.”* And all of the students will be able to do exactly the same thing. Well, the VLE, one aspect of the VLE would be really useful for that. (Jack)

And then it did become something I would use a bit more *in the classroom we’d have a look at something and then I’d say right well there’s gonna more of this over there* and I used it as way of responding to students questions and then making the answers available to the whole class.(Rachel)

*So there’s a lot of supplementary learning, they do the basic for each unit and they can do that by using PowerPoint and the PDFs and I’m trying to make it as interactive as possible with all the discussion boards.*(Christopher)

These academics all emphasise the value of dialogue between students and academics, and use technology in support of that. In each case the academic remains central to the interaction, but their strategy is to use the technology to attempt to move away from the individual nature of discourse and to allow students access to the discussion forum in order to promote discussion and dialogue between academics and a group of students. There is, however, a sense that as an activity, discourse and interaction between students and teachers sits separately from other segments of teaching and that it is added rather than integrated, in that the discursive activities are built alongside the other structured components (Prosser, Martin, Trigwell, Ramsden, & Lueckenhausen, 2005, p. 145).

This strategy is considered by many of the participants as a useful way to integrate technology into teaching. The following extract describes how technology is used to support a number of teaching strategies all of which involve dialogue, but are then linked as segments to each other and to other teaching activities

They are taking a major responsibility working with people and they are doing it virtually on an area of interest. We are putting some ideas out for them that they might like to explore that they then choose what they want *to do from there*. *So it’s actually, as far as I’m concerned, the blended learning approach is to engage them and we got them engaging in a series of ways both individually and in small groups and in a larger group as well* (Claire)

For a number of the participants, however, social relations between students are so important that they underpin a pedagogic strategy which aims to maximise student interactions with a

view to encourage cooperation and collaboration between them. This is one of the keystones of technology use in teaching (Jones, Cook, Jones, & De Laat, 2007, p. 174). The use of technology in this way is illustrated in the next extract,

*And play devil's advocate. For example women make better transformational leaders than men. Yeah? So go do some reading on this over the week, put your thoughts down you know on the discussion board. And share it with your colleagues and get their perspectives. Well you then end up with 30 or 40 or 60 different perspectives on one issue. Never a right or wrong answer it's just multiple perspectives and that's very valuable from a learning perspective (Tom)*

Student responses to the discussion board collectively build a reservoir (Bernstein, 2000, pp. 158 -160) of knowledge that is then available to the whole group of students. Teaching is situated with a context of debate and critique with the aim of developing and extending their thinking. As a strategy it links very comfortably with Dewey's notion of experimentation, when learning involves testing theory against the students own real experiences as a way of constructing a more developed model of interpretation, understanding of their own experience is tested and extended through the act of collaboration (Harding & Ingraham, 2007, pp. 147 - 148)

For the next academic, the social tools inherent in the virtual learning environment are used to encourage students to view knowledge in a particular way, in this case to take a critical perspective and to rehearse and practice some of the skills and language that support the development of critical thinking.

*It is about not so much giving them tasks to do but asking them to respond to reading and, by being contentious so that if they want to respond and they come back and they get really sort of upset and angry and they write to you and then you can use *that because you've inspired them, you've got them into it and once they're in you've hooked them and you can always tamper what they're saying to get them to look at something critically and 'evaluatively' and objectively but the issue is getting them in.* So I tend to use this type of strategy to encourage them to want to make comment about what I said or material I put forward or what.... (Stella)*

One of the most popular uses of technology in teaching is to help students both recognize authentic language, texts for different disciplinary and vocational contexts. This is quite explicit in the next extract:

*And the television documentary is 40 minutes but it shows not just the technical aspects but also the pressures of working together with different people and people might get offended when someone is rude to them or they are perceived as being rude but in the industry if you do not do your work you may not be told in the nicest possible way you'll be told in a harsh way, a harsh reality. (Ian)*

Whereas for the following academic supporting students by learning to read difficult texts has been something that technology has really added to her teaching:

One of the things that they had a problem with initially was actually recognizing how the lecture seminar here leads to the lecture seminar there. There are no connections. And working on their own to do a difficult reading is challenging especially for first year undergraduates and they are likely to say *I'm not doing that. Putting them together and asking them to do it for a purpose is a completely different kettle of fish. And we've actually got them and this is my pride and joy the first reading that they do as a group is the Vygotsky From the real Vygotsky, and you know that's pretty impressive stuff. It's a primary text rather than secondary that's explaining it so yeah. But we compliment that by giving them lots of links to sites that's talking about the Vygotsky as a person and Vygotsky's work and how it how it's sort of linked to them.* (Claire)

For the 'knower approach to teaching' group of academics, technology is used to structure activities that will generate discussion and discourse, the rationale for this emerges from a number of theories that are seen to underpin the design of teaching when using technology, for instance - the work of John Dewey, the Russian psychologist Lev Vygotsky and his theories of social constructivism and more recently to social learning theories associated with communities of practice (Lave & Wenger, 1991). The importance of social learning in the context of technology is very well documented (Jones, Cook, Jones, & De Laat, 2007, pp. 174 - 190). In the past social learning was described as being particularly important for online contexts as a means of overcoming problems associated with isolation and the possibility of drill and practice teaching methods with very little or poor feedback found in paper based distance education courses (Peters, 1998) and as a critique to impersonal, traditional, University approaches to teaching (Laurillard, 1993). Currently, however, such methods are seen to weaken the boundaries between theoretical (or vertical) knowledge and every day (or horizontal) knowledge (Bernstein, 1999) so that importance is given to the socio cultural nature of knowledge in a context of application in vocational and economic settings, an approach largely driven by social relevance as a criteria. The roles of student and academics in relation to the re contextualisation of knowledge become weakened (Bernstein, 2000, pp. 45 - 51), and students are afforded more discursive space.



Disciplinary context	Relations between students - teacher	Relations between students
Psychology	F++	F--
Education	F+	F++
Education	F--	F++
Education	F+	F--
Business	F--	F++
Business	F+	F--
Science	F++	F--
Science	F++	F--
Applied Professional Studies	F--	F-
Engineering	F++	F--
Health and social care	F--	F++
Health and social care	F--	F++
Humanities	F+	F--

Table 6: summary of the findings of the coding analysis of participant views of teaching with technology and the relationship to discourse (Key to coding in table 3 p 23)

Analysis of all the interview data for this question found that when teaching involves the transmission of a strongly insulated body of knowledge, discourse between the academic and the student is strongly controlled by the academic, however there is no control over the discourse between students and therefore the coding allocated is weak framing, as the students control the discourse spaces away from the formal learning spaces of the virtual learning environment, lecture theatres and laboratories, Bernstein refers to this as a ‘vertical discourse structure’. Whereas social relations between students are more likely to be controlled by the academic when teaching involves transmission of a weakly insulated body of knowledge and Bernstein refers this as a ‘horizontal discourse structure’ (Bernstein 2000 p157).

There are inconsistencies between the interviewees in both Education and Business studies,

Education	F+	F++
Education	F--	F++
Education	F+	F--
Business	F--	F++
Business	F+	F--

(Extract from Table 6)

This suggests that the reasons for choosing the particular approach to teaching go beyond the disciplinary context and are driven by factors that are present in local contexts that are difficult to define. Geirdottir,( 2011) studied university academics’ conceptions of teaching and found that the disciplinary context was very important in determining an understanding of teaching, however he also found that small social groups, set in local contexts, were able to differ from the larger more universal group. He also found that this was more likely to happen in disciplines where knowledge, and the content of curricula, is weakly classified resulting in competing ideologies about the identity and role of teachers and students in different aspects of the curriculum.

### Theme 2: pedagogic space

In this next section I shall explore the technological tools that are perceived to support discourse, dialogue and interaction. The first tool is that of space, and analysis of the interview data suggests that the use of technology in a pedagogic space again relates to the how teaching is perceived, for some it adds to the coherent structure of knowledge transmission in a defined teaching space:

In the following extract technology is used to help students to gain a perspective, but one that is directly linked to a specific theory and to particular vocational procedures

In the class room environment, I use a lot of, sort of, video presentations, two or three minutes long and there are videos that are supported. Say, as an example, in haematology one of the problems with students is actually getting them to visualize *what’s going on*. . *I talk to them about things like, you know, such as compliment and I’ll show them the video about the compliment path way and we sort of kind of view it together and discuss afterwards. So, I use, sort of, video and a teaching bit.* (Daniel)

Technology is described in the following extract as a way of weakening the structures of space, with the aim of moving students towards greater understanding at an abstract level

*For me, it's in physiology were using the portal, quite a lot. And the students are downloading lectures from the portal. And then doing also for my physiology module tutorials, quiz online. (Eva)*

For the next academic technology is used as a way of linking a body of knowledge to a very specific vocational context that would not be possible any other way:

*You could read a book by the way, I mean, but that's why e-learning makes a big difference because I can't put my student into a place where say the challenger disaster happens in reality it's not going to happen. And it was just too expensive and difficult to, the only way is to be partly observing what happens in the reconstruction. (Ian)*

For these academics teaching is highly structured in relation to space, but technology is used to create a context in which teaching is situated, as part of a planned teaching approach. The boundaries around the teaching space remain very strong, and controlled by pedagogic processes which are readily recognisable in the disciplinary context.

For others the use of technology allows an additional space for teaching, for some there is the view that technology can improve what goes on in the classroom space:

*Exactly you know like this works in the classroom. So now how could technology make it even better? (Sarah)*

It can be a space that students can personalise:

*I think that, you know, students can, could communicate with each other. It could be a repository for them, you know, displaying what they think are exemplars of their work. (Jack)*

The next two extracts suggest that sometimes it is difficult to explain just what the technological space will add, but that it seems to be a natural process of teaching evolution

*So it did begin as something still really quite content related in a way began to be but more interactive and a bit more related to what I was doing in the classroom. (Rachel)*

*A course that I teach at year one that is blended which has.....which you have a certain amount of face to face sessions but you have an online support and online activities for them to do which should consolidate what they're doing in their face to face learning (Stella)*

Whereas for some academics the technological space is used as a teaching tool in order for students to explore their own personal space, which in turn provides the context in which to situate learning

And they can look at it and say alright never thought of that in my environment how *does that work in your environment\_ and you get these discussions going on...and as a facilitator, as a tutor my goal really is to sort of manage that.* (Tom)

The following extract describes a series of activities which are linked to a variety of learning spaces, and there are no overall guiding principles in relation to how that teaching is managed, so for instance teaching in the lecture theatre will be different to group activities etc. and in this instance the space offered though technology is another segment in the collection.

*Well we've set up a system and this took quite a lot of thinking about and organizing. One of the, the problem that we had initially, all the courses were lectures followed by seminar usually without a gap in the middle. And if there was a gap in the middle the students were sort of blown by everything that was going on that they preferred sitting in the coffee bar and chatting with friends rather than actually reading the hand out you just gave them to prepare for the seminar. The way we set it up is that there is a lecture on a Wednesday afternoon for the first year course then there are two weeks' worth of blended learning activities and the group activities and individual activities as a whole range of things and reading and what have you. And then on the Wednesday morning two weeks later we get together for seminars.* (Claire)

Pedagogical spaces are readily changed and or extended through the use of technology by those interviewed, both in terms of what is taught and how it is taught. In some cases the technology is used to provide a space that constructs and defines teaching and for others it adds to an already coherently structured teaching space. There is also a view that adding the additional technological space to their current teaching space will be a good thing, but this is difficult to analyse; may be it is an affective component that brings a level of enjoyment or satisfaction to the teaching process.

### Theme 3: Time

Implicit throughout the interviews is the notion that technology can affect teaching by allowing students to access websites and other online materials at any time, removing the tight structures of timetabling. As a theme this is implicit in many of the responses relating to discourse, space etc. Whilst acknowledging that this is key to the use of technology in teaching, one aspect of time that is worth exploring is how technology can be used to allow students to reveal their needs at any particular moment, and therefore require a response from the teacher. From the student's perspective the present tense suggests weakened boundaries around the sequencing of teaching activity.

The following extract is an example of this in that the use of the present tense suggests that time is a fluid entity and teaching is not subject to the restrictions found in more traditional face to face teaching.

And so, I think, this exchange of ideas, seeing how other people are doing things even *if it's just to confirm that you're doing things correctly.* (Jack)

This is a thread throughout the analysis of data that through the use of technology, teaching becomes something to be consumed in the here and now.

#### Theme 4: Evaluation and control:

Academics use technology as a way of evaluating the student's progress, outside of the summative evaluation processes. For some academics evaluation methods are designed as a way of supporting students to become aware of what is missing in their understanding of the subject matter. This academic emphasizes the explicit nature of the evaluation and subsequent feedback, which is related to a specialized, disciplinary specific language:

I use Web CT learning modules system. I set up some background information for them to be, then send them away to the website and then they come back and do a *little test or give them a paper to read and test them on. That's sort of a tutorial support. I'm recapping and reviewing stuff and whether they have grasped it.* Quite often with immunology, you know, they *don't*, and yeah, I spend more time on a certain aspect. (Daniel)

For the next academic, evaluation is also an explicit process. However in this particular case evaluation set in the context of technology use is central to the teaching strategy; it is not used as a way of highlighting what is missing from the students' understanding as in the previous extract, but used as a way of determining (negotiating) what should be present in the students' final text

But I think because student activity and engagement with activities is very important, I have a model that we use to teach and get to grips with E-learning which is that you essentially start with outcomes. What is it you want to achieve? I then jump straight to what is the evidence you want to see that they have achieved with those outcomes. What activities can you engage them in that would enable them to produce the evidence that meets the outcomes? And only then do you look at what resources do you need to support the activity to *generate the evidence to meet the outcome?* So it's a kind of reversed engineered view instead of let's start with the content. Which I hate. (Tony)

Through the use of technology academics also find ways of evaluating student conduct and behavior. For example during the process of the interview the following academic talked about how useful technology can be as a way of students sharing their work with academics and other students, through the processes of evaluation

*A lot of people are fearful that people copy and stuff, actually I think, it's not such a bad idea, and especially with modern technology, again, it is easy to check where, you know, and when there is pure plagiarism of somebody else' work. (Jack)*

Examples of different formative evaluation methods show that academics find the use of technology helps students to develop a range of strategies that will allow them to use knowledge in contexts that are familiar to them:

*Some of which is the tasks that they've been asked to maybe look at, maybe evaluate in respect of their own work environment, and post their understanding of that. And then compare and contrast theirs with what two or three other people have said about their environment... (Tom)*

And sometimes in evaluating themselves in contexts that are less familiar to them:

*So virtual learning has also brought us, you know, into the interview, an interview process can be televised and dramatized and this is what big companies use to interview people, the selection process, and how do you fair? (Ian)*

#### Theme 5: Limitations to academic autonomy

Those interviewed felt that technology restricted rather than expanded their sense of autonomy and teaching is affected by a number of factors which directly inhibit the full potential:

This can be not having enough time:

*What can I really use this for? And even though I'm a technologist and I wanna use all these tools but you know I try to think very careful before doing it. Because of time you really have to think through what you are doing before you just do it. So sure I'm sure there's some great things being done with like second life or some of the other tools but I don't I try not to rush into them yet till I kinda think through (Sarah)*

and skills

*It's more of that time of getting familiar and getting the system that works for you. And then, until you're in a situation where you played around with it long enough and you got a system that works that, you know, that is manageable and works for students and yourself. It's that sort of time that has been difficult; it's the sort of*

*learning time which you don't really get assigned. I mean, for these systems to come into play. (Daniel)*

*So it's like anything in order to be able to use the tools properly, you have to have the experience and know how to use the tools otherwise you can use it very badly. And if it's like a chain saw you could end up seriously damaging yourself or someone else. Fortunately a VLE is not quite as dangerous but in an educational sense it could be. (Anna)*

Students do not always respond in a way that is expected:

*But they don't get it. Some of them just don't make that jump and it could be because they just don't have the capacity to make that jump or because I've tried lots of strategies in you know because you do [IB] is it me? Is it something that I've done or not done? (Stella)*

Or there are problems with the resources available

*Yeah [IB] to think that now on good e-learning, I might think maybe I shouldn't say this on tape in fact [IB]. But this, the web [CT] format we've got here is very old fashioned. And it's not what we'd call really good e-learning. (Christopher)*

Or there is a lack of evidence that there will be a valuable return on the investment

*Well, I am very, sort of, interested in things like virtual environments, like second life and stuff. But I've actually come to the conclusion that the students won't really engage with it... because I tried to engage with it and found it really hard. The reason why I was looking in that, in the first place was, because I can quite easily visualize a sort of case scenario where a student avatar would go into a room and see a patient and will be... will pop-up from medical history that now be, then they'll go to the LAB, choose the test get the result and then come to a conclusion and diagnosis. And, I think that I don't think the students would necessarily get involved in it, and secondly, have taken huge amount of time to set it up and then get it running. So, the technology hasn't really helped on that front. (Daniel)*

It is difficult to assess the effects that technology may have upon the autonomy of the academic but generally there was a view that they experience reduced autonomy over their practice for a number of reasons. Each teaching practice is set in a different context and success will be dependent on the skills and attributes of students as well as the academics themselves. However resources that are necessary for use in the virtual learning environment are unlikely to be as easily constructed as those needed for face to face lectures or seminars (Kirkwood, 2009). Therefore a level of autonomy is necessary for teaching with technology to be realised as the resources have to be designed and constructed by the academics themselves. There are, however, no documented systems in the University for monitoring the quality of materials produced for online delivery which are not likely to be regulated, so potentially increasing individual autonomy.

## Personal reflection

So far the analysis of the interview data has provided me with insight into how academics recognise teaching and the contribution that technology can make to their teaching. The academics participating in the study have discussed their views and perceptions about teaching in a general sense, and shown how values are linked directly to their beliefs, which reflect how they approach their practice, either in the knowledge mode or the knower mode. However when I asked them about how technology contributes to teaching the language of the participants changed to become much more practical and each chose to discuss examples of use rather than discussing the theoretical and potential uses. The analysis of values is becoming an interesting part of the study; Stiles (2004) states that there are two categories of values, the first he calls terminal values which are end-goals in themselves and relate to achieving something such as happiness or satisfaction, the second are instrumental values which are the mean by which end-goals are achieved such as being independent or logical. This offers a possible hypothesis about the relationship between technology and teaching practice, in that technology is valued by academics as a tool that gets things done, and has the added advantage that it is possible see and record what is done. The contribution that technology can make to teaching for those interviewed centres upon increased and/or improved communication for a number of practical purposes and this will vary according to the discursive space created by the academic depending upon what is to be achieved through the process of teaching.

In the next chapter the beliefs of academics will be explored and discussed further but in the context of actual examples of technology use in teaching practice.



## CHAPTER 5: CASE STUDY ANALYSIS

### Overview of the chapter content:

Having explored, through a process of individual interviews, the participants' perceptions of teaching and how technology is understood to be integrated into teaching, I then asked each one to show and discuss an example of a course or a lesson that they had designed to include the use of technology as an integrated part of the teaching strategy. Distinctive features of teaching discourse were created in each example and the purpose of this chapter is to explore the case studies in order to provide insight into the design decision making processes and the modes of communication that they used when transmitting knowledge to their students. I did not discuss the reactions or feedback from students about the teaching designs, but concentrated on the mechanisms by which academics mediate their teaching in virtual learning environments and the realisation of their perceptions about the role that technology has in their daily teaching activity. Therefore my strategy was to observe use of technology relayed through their everyday teaching.

### Introduction

My discussion with the academics in this phase of the study was framed by Bernstein's theory of pedagogic discourse, with particular emphasis upon the re-contextualising rules which includes instructional discourse that is specific skills and knowledge and the regulative discourse, which defines the behaviour and conduct of the students when involved in the processes of learning. As described in chapter 1 the concepts of classification and framing remain central to the analysis of the individual case studies and applied to the categories that emerge from Bernstein's framework. All thirteen case studies were subjected to a rigorous analysis guided by the categories as summarised and explained below:

Category	Description
Aims of technology use	This may include: <ul style="list-style-type: none"> <li>• academic discipline focussed teaching,</li> <li>• specific vocational skills and knowledge teaching,</li> <li>• generic skills development</li> </ul>
Description of the discipline	This refers to the concept of a singular discipline; an example may be Physics or Biology, or a vocational discipline such as Education or Engineering, or an interdisciplinary integrated discipline such as Humanities.
Classification of discourse transmitted through the use of technology	This refers to the complexity of the language that is related to the discipline. This may be a very complex and specialised language such as that associated with science. Or it may be a weaker grammar that includes everyday language, such as Health or Education. The content of teaching will change depending on the language of the discipline in that it may be determined locally if teaching is to be applied to the student, for example for study skills, or vocationally if teaching is related to a particular job, or universally through the discipline.
Discourse structure	This relates to communication structures which may be a hierarchical structure in that communication tends to be one way, from the academic to the individual student or a horizontal structure when the students is afforded greater access to the discursive space and is able to contribute to the dialogue.
Framing of student input	This relates to how the student is seen by the academic. That is whether they are expected to learn from the academic's formal input but there is no control over the social relations with students away from the lecture theatre or whether students are expected to contribute to discussion on the websites outside of the timetabled meetings.
Framing of teachers role	This refers to the relationship between the students and the academic and whether this fits in a hierarchical structure with strong control over communication, ways of teaching and the regulative (assessment) framework. Or whether this fits into a horizontal structure when students are given greater choice and control over communication, ways of teaching and the regulative (assessment) framework.
Framing of instructional discourse	This refers to control over the content, pacing and sequencing of the teaching.

Table 7: Ontological categories and descriptions

Findings of the analysis

As described in chapter 4, a strong influence on pedagogic discourse relates to whether the academic valued the transmission of a coherent and structured body of knowledge as a priority in their teaching, a 'knowledge mode' which emphasises the content of teaching, or whether the development of the student and the skills necessary to become a knower as priority in teaching, that is 'knower mode' which emphasises ways of knowing (Bernstein, 2000, p. 98). I found that, following an analysis of the pedagogic discourse in the 13 case

studies, they could be aggregated into two sub categories in the two overarching modes of knowledge and knower modes. These are:

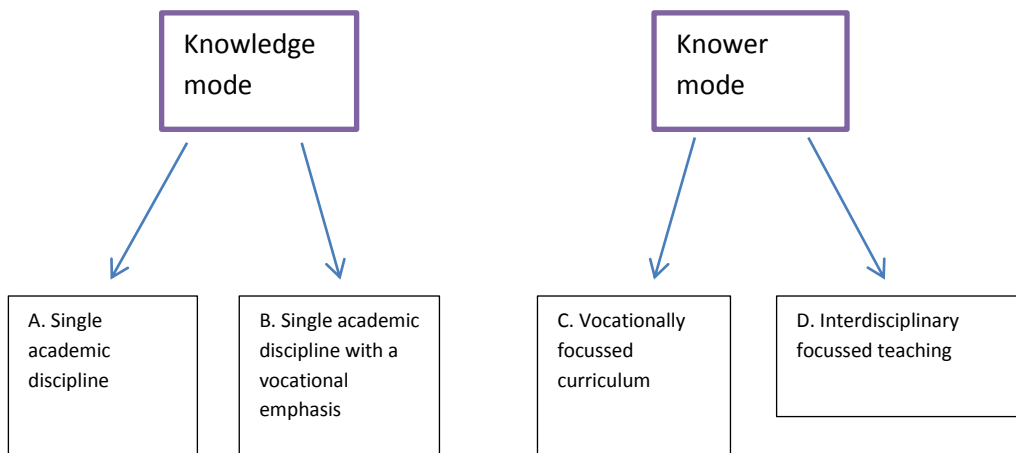


Figure 4: Diagrammatic representation of the findings of the case study analysis

Teaching that focused upon a singular academic discipline included Science and Psychology, whilst teaching that focused upon an academic discipline and projected towards a particular vocational field, included Bio Medical Science and Engineering. Teaching that was explicitly based upon a vocationally focussed curriculum included health, education and business studies, whilst teaching that focussed upon an integration of inter-disciplinary knowledge in their teaching included Humanities and Applied Professional Studies as well as one case study linked to Education. Because of the nature of the university the biggest categories were vocationally projected teaching in the knowledge and knower modes, i.e. B and C.

The aim of this chapter is not to categorise or to discuss typologies of academic but to report the findings of the analysis in relation to the way that teaching is organised, in the case studies, when set in the different modes of teaching. Of particular interest was how the mode influences the process of integrating technology into teaching and the potential relationships between the academic and their students that each mode generated.

For each category I have presented the relevant section of the analysis grid and, what I have called, an illustrative case study. These were chosen because they described in detail the approach to teaching that the coding best represents. Variations between that one case study and others in the category will be discussed as will the overall findings of the analysis after the illustrative case study.

## Section 1: approach to teaching based upon a strongly classified, academic disciplinary knowledge mode

The two case studies that I analysed in this particular group belong to academics who teach singular, highly academic subjects - Science and Psychology. These two disciplines are directed towards the production of empirical knowledge and do not have an explicitly vocational focus. Teaching emphasises the acquisition of knowledge that is increasingly integrated into theory, which is generalizable in a universal context, and therefore aims to re-contextualise knowledge in a way that is accessible to undergraduates and at the same time socialise them into a disciplinary community. The use of technology in teaching can be summarised in this context as follows:

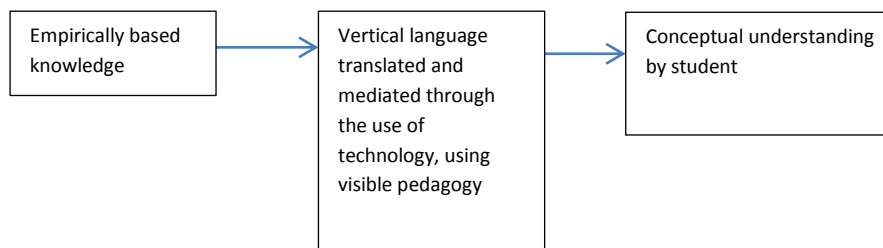


Figure 5: Diagrammatic representation of strongly classified, knowledge mode of teaching

Technology is used to help students to learn this complex research based language and student activities concentrate on the integration of this ever more scholarly language into their understanding of theory and how it is applied in the context of the discipline, not necessarily linked to the personal experiences of the student. Pedagogic discourse tends to be hierarchical and strongly framed by the academic (Bernstein, 2000, pp. 54-55) when transmission is underpinned by a tightly ‘boundaried’, vertically arranged knowledge structure. When the coding structures of classification and framing for the two case studies are summarised, the results are as follows:

category	Eva: Sports Science	Anna: Psychology
Aims of technology use	the transmission of a disciplinary based, theoretical knowledge through the use of the VLE	Skills development in a context of disciplinary based theoretical knowledge,
Description of the discipline	Singular academic discipline	Singular academic discipline
Classification of discourse transmitted through the use of technology	C++ very strong grammar	C++ - C-  Combination of academic and study induction in a singular discipline. A pragmatic need for communication and reflective skills development in new undergraduates
Discourse structure	Hierarchical- interaction initiated and controlled by the academic – directed at the group for individual consumption	Hierarchical  Online activities linked to summative assignments
Framing of student input	F- -  Weakened control over time and place of summative assignments. No formally constructed social space online	F- -F+  Group activities using ‘you tube’ and individual reflective logs used to encourage integration of skills in disciplinary knowledge
Framing of teachers role	F++  Content controlled and delivered in a specific order, regulative rules based upon attributes of diligence and a desire to acquire traditionally based knowledge	F++  Activities and content controlled by teacher and set in the academic discipline. Social activities controlled through summative assessments. Regulative rules formally assessed - engaging with the activities collaboratively and socially.
Framing of instructional discourse	F++ - F-  Pace and sequence of teaching controlled by academic, assessment criteria determined by the disciplinary context, some weakening of control for online summative assignments, open book, open computer system	F++ - F-  Social activities are controlled and assessed. Some control given over to students for the design and content of the ‘you tube’ video, topic is pre- set in disciplinary context.

Table 8: Result of Coding Activity

(Please refer to table 3 (p23) for the key to the coding categories)

Illustrative case study:

Eva uses the virtual learning environment as a way of supporting the classroom teaching for her first year science students

For Eva teaching comes from a passion for her discipline

I just love sharing my knowledge and expertise in the area of sport, I just love it.

It is this commitment to the discipline that directs her approaches to teaching and in turn she expects a similar level of dedication from her students:

*Going to University I still believe... naively... that you choose a subject for the passion of it, so you throw yourself into it. Not necessarily every single aspect because it's very diverse but at the same time its still sport and we share this... for the passion.*

Eva's preferred approach to teaching is the transmission of a disciplinary based, theoretical knowledge through teaching methods that are highly visible and aim to distribute the specialised language of her discipline; teaching happens in specialised spaces such as lecture theatres and laboratories, and her practical experience and knowledge of her subject is central to the process. The use of technology in her teaching is embedded in her commitment to the student's progress and achievement in the disciplinary field:

*...it opens the page where you can see lecture material, announcements, assessments and stuff like this and this assessment in my case for the physiology a part of their summative assessment. Handbook, some lecture plans and all this sort of course... information and then follow up... and then I've got a lecture notes for each individual session And in this folder you'll find video files and god knows, all the stuff*

Eva recognises that students do have a need for some learning that is generic, that is not obviously science, and technology proves a useful tool for providing teaching for additional generic skills teaching:

*Well sometimes I make them (videos) but not for this course, I have another course which is called 'professional research skills 1' and some of the guys they are very bad, for example, using excel. So I created excel files with... I use 'jinx' because it's free, and it records my voice... as well and in its on screen filming. So you have 6 minutes I think no more, then I show them how to use excel with some things. Stuff like this, very basic stuff how to calculate mean and standard deviation stuff like this, so they can look at it and listen to my voice, but as often as they wish to.*

The naturally insulated context for her teaching means that even for this generic subject matter the personal nature of her teaching remains very important, the content of her videos is filtered through her as a person, herself on screen and her voice that can be listened to over and over again. However these tightly formed boundaries around the disciplinary content of the programme have been weakened recently and a teacher from another department now teaches a subject that is considered to be very important to the field

*It's data analysis tool. And this is something that most of them are really struggling with, Big times Yes, we have for the very first time, thank God we have a maths teacher. From the school of Mathematics... she just started as a teacher and because it's not a new module, it's evolved as a mix of practical and research skills, now ..*

*'Professional research skills'. But for the very first time you know, have this maths teacher teaching this and we don't have this also as part of the assessments so they gonna do the assessment for this module online.*

Technology is the chosen method of assessing the students achievement in maths and despite the reference to 'professional research skills', inferring an applied approach, the point is made that the subject of maths has been removed from other assessments, suggesting that at this lower level it is important for students to demonstrate a level of proficiency before learning and meaning can be integrated at a higher level in the hierarchical science knowledge structure.

Eva realises that there are advantages for students being able to study at times other than in the context of the structure of the university timetables

*But then the students know how to know how to use this tool, therefore they can just get on with things. That's not a problem. I mean... in terms of using technology... the students are usually well ahead of us, that's for sure.*

And technology can be used to facilitate this in terms of extra teaching as a way of providing opportunities for students to improve their knowledge:

*They can use this I sometimes create a file, otherwise I produce them from disc material from textbooks, I put the lectures in the portal 'you tube' files. And play... them during the lecture to show this... and then I give them the link in the, they can look at the particular file again at home.*

And she has extended this use of technology to the domain of summative assessment:

*I've created the assessments in here. And I set them up... in a way that students, we go from week to week. So from lecture to a lecture topic and after this, this quiz is released to them, they have got two weeks to do that quiz. They have to pass with 40% and then the next quiz will be released which will be then be delivered over the next week so on this case it's a respiratory system. So they have two weeks to do each quiz, but in order to, for them to open the next quiz, they have to go with the benchmark of the University of passing the previous one... They do it from anywhere, anywhere that they can access the portal. I've created this a while ago. It's a lot of multiple choice, I've also have very often graphs in there or matching pairs... depending how much time actually I had to create all this*

The aim of this assessment process is linked directly to an explicit approach to teaching, which regulates student's learning, not only the learning of a highly coherent, principled form of teaching but by explicitly linking it to the assessment to their commitment to learning also

*I just want to... encourage them to go over the material, because they've got one hour to do each of those tests. With a little bit of sort of University assessment criteria... integrated in there... to go through the knowledge and they have as many attempts as*

they want. So even if they have passed it they can do it again and just practice with the quiz, let say because a lot of them is multiple choice, so they might just by pure chance were successful in a particular test but by having been successful they know the next one is released so they can just use this to play a little bit and say do I really know it? Of course they *don't tell me this, that doesn't really matter. And if they do this in their own time, nobody has to shine.*

The reason for this use of technology is based upon what Tirri et al (1999 p 918) names principles of teaching practice, rather than rules of teaching practice. The first principle relates to a desire to be fair so that some of the control for successful completion of the quiz is given over to the individual students, they can practice and take the test as many times as they wish, providing that they demonstrate a level of diligence in their study, this is the second principle. The third principle relates to a sense of duty for Eva in that she wants to encourage them to learn. But the justification for the use of technology in this way is summed up in the final statement - *'they do this in their own time and nobody has to shine'*. For Eva this relates to a general principle that students do share the passion and will find pleasure in learning about the discipline, albeit secretly, and the agenda for this statement refers to a broader issue of student behaviour

*Were trying e learning environments and putting more, more knowledge on it and... I don't know, video files and making the whole thing more practical in physiology. Different if you turn the page over... if you see files, animations and stuff like this, but then at the same time with the attitude of our particular students and we have little bit of different breeds for some students are bit of a different breed... But in general attitude of sports science students is a bit like laissez faire, comme se comme sa, there's at least a high percentage of students in the class who find it actually quite interesting to get a fail. They don't seem to be bothered by failing.*

Teaching and assessment of students for Eva is about their acquisition of traditionally recognised knowledge, and technology is used quite explicitly to support that objective. In this case the summative assessment activities are designed to counter the very strong social relations of the classroom and to encourage students to engage secretly. Recently Eva thought about extending her skills in the use of the VLE however found that there is a line

*I was actually starting to go on this course e-learning 'transforming teaching through modern technology' that was the first course and then I blissfully gave up.*

And when asked if she felt that technology could be used even more in her teaching:

*I think I could see this happening and sometimes I wouldn't even mind doing this but it would not suit a lot of our students doing this. It takes a particular student who engages with this. And says, yeah, that fits into my life and into my style of learning and I'm really fully on board with this one. This doesn't work for sports science; I*



could not see this happening in sports science only for very small percentage of students

Technology use in teaching is described by Eva from her epistemological standpoint and according to her statement above; she intuitively relates this to her specific context (Tirri, Husu, & Kansanen, 1999) which also includes her immediate colleagues in her department:

*I rely heavily on it all the time, I'm confident with this but I was also relying on colleagues who show me how to do things and I just learned from it, I didn't teach myself necessarily. There some of the stuff I did, other stuff I am really relying on other people. I'm not the generation who grew up with a computer, so I've still got gaps. A lack of confidence in certain areas and it's great to go to a colleague and say please can you show me how to do this and I do this.*

#### In summary:

The greatest impact for teaching in the category of non-vocational, knowledge mode is a strong epistemological influence, resulting in a desire for students to become en-cultured into the discipline which also means cultivating the language that is expected by the academic plus the skills to build knowledge through processes of empirical research. Formal teaching is the way that knowledge is distributed to students in this epistemic relationship and technology is used as a tool to support this form of teaching. Eva recognises that students vary in their ability to achieve the appropriate language, and provides a way of supporting them with summative assessments, through a process of weakening the boundaries between the classroom and home, and to allow an 'open book' and 'open computer' approach as a way of encouraging individuals to improve their disciplinary knowledge.

Anna also recognises that students need to be taught the language of the discipline and has been part of a team of academics who have designed an academic skills course for first year undergraduates, however she identifies the difficulties for students in learning to talk the language of psychology:

*It's not psychology, it's sitting alongside. Because we know students come into higher education totally unprepared. Some of them are good majority of them need direction.*

As a way of supporting students in this way Anna uses technology to encourage students to use every day language as a way of encouraging them to talk about psychology

*So what we've done this year is we've said we want you to make a little short video that we will upload onto the departmental YouTube channel. What we want is a little short snappy demonstration of some sort of psychological task. I don't know if you've ever seen the drop task. It's very simple the time it takes you to catch a ruler from*

somebody dropping into tells you a lot about your visual stimulus and your motor sensory information it goes from your arm to your brain

The task involves students working together but the social goal underpinning the activity is one of achieving a greater understanding of a psychological concept, which is not 'problematized' in any way but presented as an experiment

*And put two females and two males together and said try to see if there is a gender difference and who snapped the most. So simple little things that you can demonstrate even using a mobile phone, so this is what we're doing*

However students struggled to recognise this use of everyday language as a form of pedagogy that is helpful to them in the context of the disciplinary language.

*But it fell flat on its face because we didn't grade it. And students said 'if I'm not getting anything in return I'm not gonna do it'. So it fell flat on its face for primarily that reason. So this year we've made it part of the course grading it's about 20% of the course.*

Teaching through the use of technology for these two academics, Eva and Anna, is controlled by them in terms of the content and pacing using highly visible approaches to delivery. Dialogue is hierarchically organised whilst social relations between students are not controlled as discussion between them largely takes place away from the classrooms, lecture theatre and website, although Anna can appreciate the benefits of students learning to work cooperatively. Both academics have used technology in order to weaken their control over the students particularly in terms of time and place of learning, summative assignments provide the motivator for activity by the students.

## **Section 2: approach based upon a strongly classified, academic discipline knowledge mode and projected towards a particular vocational field**

If teaching in a context of a single academic discipline is considered to be situated in the future but in a narrative of past, (Bernstein, 2000, pp. 66 - 67) resulting in 'Tight control over discursive inputs of education that is its content, not over outputs' (p67). The vocational focus to teaching aims to shape student learning towards 'cultural, economic and technological change' (p67). Pedagogic discourse for this group of case studies is shaped by traditional approaches but applied in a way that increases the potential economic performance of the students. Along with a coherent and systematic approach to the instructional discourse, students are also exposed to a specific regulative discourse that includes attitudes and

dispositions that are considered to be relevant to the particular vocational setting; therefore the future career of the student is situated in narratives of past approaches to teaching. Technology is used as a way of supporting students in order to learn the very strong grammar of the disciplinary knowledge and as a way of helping them to situate that language in complex vocational case studies which aim to problematize student conceptions of the discipline by exposing them to a variety of relevant phenomena. The results of the case study analysis are summarised below:

category	Daniel: Bio Medical Science	Ian: Engineering
Aims of technology use	Transmission of specific vocational skills and knowledge	Transmission of specific vocational skills and knowledge
Description of the discipline	Singular to regional	Singular to regional
Classification of discourse transmitted through the use of technology	C++ very strong grammar	C++ very strong grammar
Discourse structure	Hierarchical- interaction initiated and controlled by the academic – projected outward to specific vocational setting	Hierarchical- interaction initiated and controlled by the academic – projected outward to specific vocational setting
Framing of student input	F- - no managed discursive space for students, weakening of boundaries of space/time for tutorial revision material.  Any weakening of boundaries with students for formative activities and support anticipated to be unpopular with students	F--  No managed discursive space for students  technology used to develop students understanding of rules in the disciplinary context
Framing of teachers role	F++ control with the academic, wishes to increase control through the development of content (e.g. LAMS), with increased emphasis on situating teaching in vocational setting. Regulative rules – mental agility and problem solving	F++ control with the academic who uses all available technology fully, with particular emphasis on situating teaching in disciplinary context. Regulative rules –to be successful/ survive in the working environment
Framing of instructional discourse	F++ strongly controlled by academic, own expertise and experience central to teaching. Case studies used to convey the complexity of vocational setting	F++ strongly controlled by academic, own expertise and experience central to teaching, televised case studies used to convey the complexity of vocational setting

Table 9: Result of coding activity

### Illustrative case study:

For Ian teaching is constructed around the particular requirements of the vocational field of engineering, whilst at the same time using approaches to teaching that are in the best interest of the students. Tirri et al (1999 p914 -5) in her study of school teachers found that teaching in a vocational setting results in a desire to demonstrate ‘social value to others’, as well as communicating a sense of activity that is fulfilling and meaningful to the individual student. For Ian communicating this sense of vocation is important in his teaching and results in practice that is justified by concerns for student learning, and their moral and ethical development

So in terms of what teaching means to me, it means that my students at the end of the day, I should be able to do the best and I want the best from them. So how would you get the best from them would vary from student to student and from subject area to subject area

Ian refers to a set of rules that have emerged from his practice of using technology in his teaching; the first is to concentrate on purposeful teaching and as such teaching is highly structured, clarity for students is provided by a planned sequence of activities and timed control over the release of teaching materials on the virtual learning environment is part of that planning

The lectures notes are generally released by an automatic release. So once the time, *the date, people don't get confused.* Otherwise, you know if you release everything at once people might tend to read, so it kind of puts it in balance hence the deliveries so *you don't go around giving them all the information. I tend to release it a week before my lectures.*

And another rule about how information should be presented to students via the VLE, his justification for this practice is to protect the students from misunderstanding, so that the process of transmission is efficient, and students are able to improve their knowledge

*I don't release my power points. Because my power points are for me to facilitate my teaching, you should not be learning from power point because a power point presentation or any presentation may be power point or PDF it doesn't matter. It's designed for the presenter not for the audience. I might have a keyword that remind me of the whole sentence but otherwise wouldn't make a lot of sense.*

Ian expresses a strong sense of loyalty to his students and produces additional materials specifically for the VLE that are in the interest of learning

*One of these just... so that's on budgets and budget free control so that's full freestanding notes that you don't need a textbook or something there are some*

*references at the end that people can go to. That's delivering the lecture notes; if there are other items that need to be put I could upload it up there.*

Guidance for student's learning is very apparent in his formally structured activities as his sense of obligation to the students extends to what Tirri et al (1999) call 'intuitive high hopes'

*We put them into a scenario 'being recently employed', he is a manager and then he has to compare two companies using inquiry-based learning so he has to go and then inquire and find out, and hints are given on what they need to discuss and how many marks for each.*

For Ian the design of the website relates to the development of the individual student, communication flow is controlled by him, however there is a weakening of boundaries between the university and other places that students may access course materials. The pedagogical space provided by technology extends teaching outside of the classroom and Ian sees clear benefits for students of this:

*This is given via the portal. But if they are at home they can still get this thing, if they become sick, or they can be travelling and we have the part-time students, we have the what is it called, the distance learning mode in some cases. Like an OU student they could study from a distance, because all the material is there for them. So even if they do miss a lecture, they haven't really missed anything apart from my explanation of course.*

Ian discusses assessment strategies in connection with his use of turnitin and is keen to demonstrate the level of work that is needed to use this tool but is also keen to reveal the quality of the thought processes that are necessary for online marking and feedback

*I'm still marking I'm gonna release this to the students so its *work in progress*, it's quite... it might be a good example. I will show you probably the top end of the class and probably go down. I have a program, pre programmed comments that I can use as... *Yeah so I can, I can*, yeah drop a comment and say for example this is a comment, but you can type in a command manually like, you know, writing an *executive summary which is different from a normal summary is that it's a selling point*. So here he needs to be assertive and say this is what I want you to do.*

He justifies the amount of time and energy that marking in this way takes by two general principles, the first from his educational experience is that feedback given in this way is another form of teaching

*It's like a lecture. So it can give, you know, feedback can be quite quick you can program feedback like that e.g. *don't repeat it again only define it here*. You don't need to do that. This is a very good work. I used rubrics here if you can see the comments that are coming. So this feedback here is not just the grades for each one*

but it also shows the performance. So I put in this comment and when it goes live - she *can click onto that and it will take her to... the university self help guide on referencing*

And from his experience in the respective vocational setting, there is a need for students to learn about social responsibility and moral conduct and Turnitin provides an opportunity for such learning.

The reason I believe is that there must be tough penalties for learning to plagiarise. *Because that's what happens in the industry you go and... You drive into someone with your car, you'll pay the price by going to court and you go through a camera you'll say that the...that's what in the world happens, if you kill someone at work you will be charged with corporate man slaughter. Some things students have to also learn it the hard way, in a manner.*

Ian also uses technology to teach ethical and moral reasoning explicitly by linking a group activity that aims to explore the values of the students with his teaching. In this activity Ian shows how disciplines such as engineering are influenced by social forces, and how those forces bring a sense of instability to systematically organised knowledge:

The other thing that we are doing is looking at, have you used personal response system? *That's, now how can this thing help? So you know what people perceive. So ethical investment what is it to you? - I don't care, it means a lot to me, somewhat important, - what is ethical investment. It might be someone who doesn't even understand the concept of ethical investment so they can look at what your perspective is. So this is the e-learning to the class in a different manner. So it would mean looking at something from different points of view.*

Here Ian illustrates a different relationship between the students and the discipline, previously his teaching had focussed upon the effect of the tightly controlled structures of the discipline on them as future employees, but this time there he explores the way that the individual can shape disciplinary knowledge as a discursive activity

So it would mean discussing the assignment but looking at it from different points of view, I can't answer every question because there might be lots of ethical students that might change from year to year. Say a few years back it might be less ethical people *but as we become aware of what's happening all around the world, young people tend to be more ethical because they are brought up in a manner where.... a smoking for instance when I was at a university, you go to the bars and pubs will end up coming out smelling, but now people will look at you as a rude person*

Part of Ian's concern for student learning is frustration about the technological systems used by the university as part of its teaching and learning strategy, and wishes that the university could be more business-like in its use of technology

*It does frustrate because you know many students cannot use it and the system doesn't work, or the portal is unavailable, and having worked as, you know, in my previous jobs I've had, systems like this for over six years it's really not as complicated as people think. This needs a commitment of resources and the technology is already there. It's not the technological challenge, if the commercial website can stay online for 99% of the time why can't this.....*

And because of his expertise Ian is able to write a programme that removes the necessity for printed registers, and in addition, sends an email to those students who were not present at the lecture. The programme is also designed for the personal response system

So one of the things we use, generally we would have a printed register that we use. We do have a system to get an automatic printed register. But one of the things we can do is when I click here what happens is that a little program runs; these are the courses that I teach. They are big like 200 people in the class, 120 this one and so on. So simply I just save this, next, and then it says start capturing, register. One moment, *I don't need to, I'll put... And it will be running in the background.* So they log in to the correct channel which there is a procedure and when they log in a green light flashes telling them that they have been logged in and then you start capturing the register

Ian uses technology in his teaching in order to combine a strong disciplinary focus, in terms of specific and systematically organised knowledge with a vocational context. The resulting pedagogic discourse focuses on the instructional material delivered as part of a hierarchically organised knowledge centred design, but intertwined with an overt focus on values, driven by a vocational responsibility which is communicated to the students as a way of preparing for them for work in the field of engineering.

#### In summary:

The analysis of the two case studies in this category, Ian and Daniel, reveals a use of technology that aims to bridge the gap between teaching reliant upon a strong epistemological basis to knowledge and a 'real world' vocational setting. Once again formal teaching is seen to be the way that knowledge is distributed to students in this epistemic relationship and technology is used as a tool to support this form of pedagogic discourse. Teaching in terms of content and pace are tightly controlled by the academic and assessment procedures concentrate on what the student does not have both in terms of theoretical knowledge as well as attitudes and skills. The academics make use of themselves and their own experience of the vocational field when designing teaching, including the use of technology which they both see as very important in teaching

*If you're going to Barclay's. One of the cashiers won't say I'm not going to use the Barclay's computing system I'm going to use my own freedom of thought ... so why is it not being enforced? Because some lecturers say that I won't do it because I prefer this way, but that's confusing for the student because we are looking at it from whose perspective, the actions is not for me, it's for the benefit of the students...(Ian)*

They therefore become frustrated with the resources available to them

*Yeah, I mean, because, the other thing that I felt sort of kind of tied or ... not tied, and feel restricted I supposed by the VLE that we have is, you know, some of the systems we're going to introduce in e-learning modules, from the E teaching course, called LAMs, which looks really, really good, and particularly good for the case study analysis, which you can get from patients and where you can say, well I go to this file here, choose which test you like, and then, having chosen the test and then they get it [cross talk]. So you can actually sort of go through the patient half way if you like, that's where I was coming from anyway. But, it is difficult in terms of getting access to LAMs (Daniel)*

No official discursive space is built into the design of the VLE for students as again the dialogue is hierarchical and one way, and collaboration between students is largely uncontrolled by the academic. Both academics recognise that the weakening of boundaries in terms of time and space have advantages for students. Daniel identifies that there are professional pressures to weaken the boundaries of the hierarchically and principled knowledge structure that frames teaching in the field and introduce opportunities for an everyday language use by students in the form of a reflective portfolio:

*And, I was also interested in pebble pad as well and those sort of things. Because there's another system you have to physically go to and go into it and review, and remember to review on a regular basis that I find it very difficult to. It's assigning time and actually then getting around doing it. So, there are sort of areas that I'm interested in and reflection, and reflective diaries, and sort of things, pebble pad is very good at. And then, from the professional perspective, that's what the profession requires in order for you to become most a registered biomedical scientist. (Daniel)*

However he doubts the success of such systems for his students

*I think it would be very foreign to them because they think that they have never been asked that question. Yeah, it's always been teacher led and it's always the teacher that tells you. And, for some I think, it would be quite liberating. For some, it would be incredibly scary, you know, hate the process completely (Daniel)*

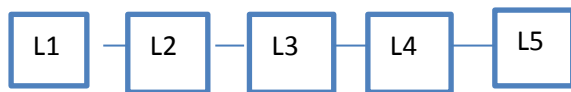
The analysis of these two case studies provide evidence of teaching influenced by a strong relationship to epistemology (Maton, 2006, pp. 43 - 59) and at the same time having to change the dispositions of students. In both cases control of pedagogic discourse remains with the academic and less consideration to the social relations in teaching are given. However in both cases technology is used as a way of weakening that control in terms of time



and space, and there is awareness that technology used in teaching may allow students to shape their own future in terms of learning and working and possibly the vocational field as well.

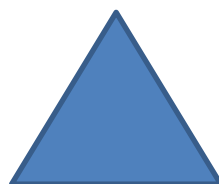
### **Section 3: An approach to teaching based upon weakly classified knowledge in knower mode and a vocational focus**

Teaching in a context of weakly classified knowledge, with a knower mode results in a horizontal structure to knowledge, and teaching in this category aims to present students with knowledge of vocational practice of different sorts, in this case, education, health and business studies. Unlike the previous two sections when the disciplines e.g. science and engineering, were strongly classified, each of the case studies in this section are weakly classified and knowledge is structured horizontally in them, for instance in health studies students have to be aware of the sociology of health, the psychology of health, health practice and many different approaches to research, etc. this can be represented as follows, L = language



(Bernstein, 2000, p. 161)

Whereas a hierarchical structure as discussed in sections 1 and 2 of this chapter can be represented as:



(Bernstein, 2000, p. 161)

Figure 5: Diagrammatic representation of horizontal and vertical knowledge structures

The same principle applies to both education studies and business studies, and presents the academic with a number of difficulties in that sequence and pacing of teaching are much harder to control as in order to engage in learning the student has to learn several different languages. Technology is used therefore to bring collections of resources together which are

arranged in segments of teaching by the academic, whose own vocational experience is important.

In each of the case studies in this category the academics were keen to use technology in their teaching as it was important that they, as academics, appeared to be innovative and interesting, and this was important because the vocational subject that they were teaching had to be experienced by the student not just as practice but as best practice, this phenomena has been reported in studies of teacher educators (Ensor, 2004, p. 155). This link between innovative and progressive teaching and their professionalism in their own vocational context is also a theme in each of the case studies in this category, including health and business studies. The aim of teaching therefore is to model a set of values that demonstrate best practice in a broad sense and importantly how it can be applied in the student's respective vocational setting.

A great deal of learning in this category is highly context specific and it is the degree of specificity that defines the complexity of the language that the student has to encounter, that is subjects such as economics or linguistics are less context specific and much harder languages to learn. Students have difficulty in recognising how to talk and write in vocational, horizontal contexts and technology is a tool that is used to enable academics to provide controlled discussion through the use of discussion boards and social learning opportunities. These become strongly controlled by the academic as they are also the site in which students experiment with application of new knowledge to practice scenarios. Such activities are necessary in order to make meaning and identify best practice in a variety of contexts.

category	Sarah: Business	Claire: Education
Aims of technology use	Skills development in the transmission of specific vocational skills and knowledge	Skills development in the transmission of specific vocational skills and knowledge
Description of the discipline	regional	regional
Classification of discourse transmitted through the use of technology	C- designed to incorporate everyday language	C+ - C- mix of strong grammar and everyday language
Discourse structure	Horizontal - interaction initiated by the academic	Horizontal - interaction initiated by the academic –and defined by a professional curriculum
Framing of student input	F+ - F—  Pre- set activities linked to student discursive spaces. Weakened boundaries of space /time for teaching materials	F+ - F—  Pre- set activities linked to student discursive spaces. Weakened boundaries of space /time for teaching materials
Framing of teachers role	F+ formative conversational and social activities key to design of course. Linked to individual reflective journal	F++ formative social activities key to design of course. Feedback given formally to the activities, conflation of formative and summative assessment. Regulative rules relate to self- regulation, social learning and keeping up with pace of activities
Framing of instructional discourse	F++ social teaching methods and resulting activities strongly controlled by academic. Students have access to materials across boundaries of time and space	F++ social teaching methods and resulting activities strongly controlled by academic team. Students have access to materials across boundaries of time and space

Grid continued below:

category	Stella: Health and Social Care	Christopher: Health and Social Care	Tony: Education	Tom: Business studies
Aims of technology use	Skills development in the transmission of specific vocational skills and knowledge	Transmission of specific vocational skills and knowledge	Transmission of specific vocational skills and knowledge	Transmission of specific vocational skills and knowledge
Description of the discipline	regional	regional	regional	regional
Classification of discourse transmitted through the use of technology	C+ - C- mix of strong grammar and everyday language	C+ - C- - mix of strong grammar and everyday language	C --Mainly everyday language, with reading of research	C --Mainly everyday language, with reading of research
Discourse structure	Horizontal - interaction initiated by the academic	Horizontal - interaction initiated by the academic but strongly influenced by the experience of students in the group	Horizontal - interaction initiated by the academic but strongly influenced by the experience of students in the group	Horizontal - interaction initiated by the academic but strongly influenced by the experience of students in the group
Framing of student input	F+ - F—discursive activities initiated by the academic, then gradually weaker control over the discursive space as students populate and influence the direction of the discussion, plus space/time for support materials	F+ - F—discursive activities initiated by the academic, then gradually weaker control over the discursive space as students populate and influence the direction of the discussion, plus space/time for support materials	F+ - F—discursive activities initiated by the academic, then gradually weaker control over the discursive space as students populate and influence the direction of the discussion, plus space/time for support materials	F+ - F—discursive activities initiated by the academic, then gradually weaker control over the discursive space as students populate and influence the direction of the discussion, plus space/time for support materials
Framing of teachers role	F+ formative social activities key to design of course  Regulative rules relate to critical thinking and questioning authority as additional professional skills	F+ discursive, interactional, social activities key to design of course  Regulative rules relate to collaboration and cooperation	F+ discursive, interactional, social activities key to design of course  Regulative rules relate to collaboration and cooperation	F+ - F++  discursive, interactional, social activities key to design of course  Regulative rules relate to collaboration and cooperation, and integrity, as formal exams used to establish authenticity of student input
Framing of instructional discourse	F+ -F-  Controlled by academic, views and values of academic key to teaching. Content can change depending on student feedback	F-  Controlled by students, views, experiences and values of students key to teaching. Content changes depending on student interaction	F+ -F- Course structure controlled by academic, but dependent upon students, views, experiences and values of students key to teaching. Content changes depending on student determined outcomes and interaction	F- - F++  Controlled by students, views, experiences and values of students key to teaching. Content changes depending on student interaction  Exams and face to face input used to check and test individual contributions

Table 10: Result of Coding Activity

### Illustrative case study

Claire uses technology in her teaching as a way of prompting change to the way that she and her colleagues teach. In this case the course is part of a Degree programme for students of Primary School teaching, and is one of the first courses that the students will experience in their first year:

In order to get the blended approach we halved our face to face. And put in the blended So that the additional amount of time that we are putting in is on feedback.

This goes beyond her personal desire to support students in developing an independent approach to their study, and includes practice that emerges from evidence about enhancement and change from writers such as David Nicol of the REAP project who emphasises the need for constant and structured feedback to students particularly in the early stages of their study (Nicol & Macfarlane-Dick, 2006)

Yes from the very beginning because another thing obviously, a bee in my bonnet is *assessment they weren't given any feedback from anyone until January/ February.* And this is actually giving them feedback when they need it as they come in, which is supporting their transition into higher education as well. And it also has given us the knock on effect of us finding out if there are any potential drop outs or none. And if *we haven't had that communication with them through the online environment we wouldn't have done that.*

In this way Claire is addressing two issues the first one is to provide the students with induction in to the social order of the university and the second is to address her concern for the potential for unequal participation by students in the course activities, she feels that it is important that all students are involved in all activities

The online environment is making sure that we can keep tabs on people as well. You know the submission centre is very useful for being able to go back and saying she *hasn't picked that up*

Changing the way that the course is taught is a collective activity and includes a number of academics who participate in different ways according to expertise and skill

Three of us are involved, I do half of it. There are four seminar groups. I do two of them and my colleagues do one each. Colleague X is an IT specialist anyway so he felt okay with that, and colleague Y knew the content better. So all in all we worked well together on it.

Technology is seen by Claire as key to the delivery of this course and she draws upon her learning from a university e learning course for academic staff

*I'm not saying this is the best thing since sliced bread I use the CELT setup really, for how to do it. And we've just sort of tailored it with our pretty pictures and things like that, using 'Online Campus', that education and training use. I went through the CELT course on the second year of operation so it was very sensible for me to follow that.*

Teaching on this course contributes to a pre- set teacher education curriculum and therefore Claire expects to control the ordering of specific content to be transmitted to students, but extra resources are made available to students as necessary

*So we've got submission centre where they put their various things in, I'll take you behind so you can have a look around. Select your destination, we've actually got it split into..... obviously that's this page, the online campus home page. This is the home page, the resource centre where we put absolutely everything that they need for different bits and pieces. . But the other things you've got there are units. So the first unit on the picture is there is, because all of this is about how children learn.*

The website is designed around principles of logical transmission which is clearly visible to the student. The design is driven by specific goals, including the learning outcomes for the course as well as induction to university study

*So the first unit I actually take them on a school tour around it, before we get into the content of the unit, so that they are sort of taken round all the different places and asked to find something to look at something else and what have you. It doesn't look very pretty at the moment we need to prettify it. And we then go into the units and basically this is the same layout for all the different units, but they are all slightly different. According to the lecturer who did them, and also to the content of them as well, I'm trying to bring more consistency about, so there is a clear order of what happens. So explanation of what this is about, learning outcomes, referencing workshops and the workshops are actually then split into direct activities where you are looking at certain things, so it's a straight link through to documentation. You've got the lecture slides there as well of course, I forgot those are there. They are a different entity. And then telling them what is going to happen in the seminar.*

The resulting website contains multiple segments of teaching, each designed to offer a different form of teaching, and designed to maximise student engagement with the teaching materials. There is also a need for strategies that link the development of skills and knowledge in the individual student with the knowledge and skills that are being established for the whole group, this takes the form of a reflective log

*It's organizing that and a lot of students will actually print this bit out and then take things off as they do them. And they actually quite like doing that, because it gives them a sense of purpose. This is the first one, the tough unit. And then I've also picked up some really nice radio pages, and this is lovely because it's actually got some of the people who's reading they have to then go and do, talking about some of the issues. So we've got bits and pieces like that, the reading group is now set up so*

*they've got to download a reflective log and you know keep it going and this is what you've got to do with it. So it's pacing them as well.*

As part of the design of the website Claire is conscious of the need for social relations between students to be developed as a key aspect of the teaching, it is an important part of the pedagogic discourse and is aimed to help the individual to modify their thinking

*Third one this is coming under some tough stuff so this time they need to put out an online submission in, so let's get more information about that. But they are working together, so it's easier for them to do it together. By the very end of the course the last thing they do is an individual submission, so they work together on doing these things before we actually ask them to do it for real. So the learning theory is threaded through. And of course they've all done it from a slightly different direction, so they can then actually go through and look at each of them.*

Claire is aware that the successful use of technology in this course changes the relationship between her and her students, which needs to be sustainable

*Then, the difficulty is, for me is in gauging how long this whole thing is going to take. And I think this is one of the issues whenever you are devising online materials for other people, you're coming at it from a very different position. But I see it as a really useful vehicle, once we are there, we will pull this now into the third year as well, of course they do the ground work in this course, where we've got confidence now*

Claire is also keen to promote an additional form of tacit pedagogy by emphasising and developing emotional bonds between the students in the group

*There are 30 in the group. But they are in smaller groups of twos and threes which means that they have got to talk to each other before they submit. They will be sharing when it comes back so I'm getting the social interaction going on there about the issues. But it's also reducing the amount of feedback that we have to do at our end.*

The affective relationships extend to the lecturing team and Claire explains that online interaction is a beneficial way to build cooperative relationships between students and academics which is in the best interest of the student's learning

*Yeah and again it's sort of focusing down... they had to write for their school work you know school experience work they had to write very tightly for their finals there. So it's sort of getting them into those kinds of rhythms. But I like the fact that we can give them regular feedback between sessions and they ended up having an individual relationship with us online as well. They see a sort of they are unmasking us in the lecture. They see us in seminars but we've read their work. And of course the other benefit of that is as far as the teaching goes is that we get sufficient feedback on their understanding to engineer our seminars and benefit them which is something that doesn't always happen in our education.*

Claire does feel that one of the most gratifying aspects of using technology for this course is the way that the site is designed to introduce students to a variety of different, vocationally relevant languages. One of the problems for the student is to know how to apply the multiple segments of teaching that make up this course in a legitimate and meaningful way and the use of technology provides a way into that cultural reality

But as primary... *you know they are all primary practitioners we are used to having to work with children's thinking. We use teacher's TV all the time and we take them into classrooms we get them listening to teachers talking to each other. It's actually a vehicle that we couldn't have used as well in any other way. This is one of the things that I'm really pleased with is .....We've got these as audio readings these are children reading from a book. So we I give them the clip from the book they listen to the child read and they work out when the child has gone right or wrong.*

Which is a valuable addition to the course that was not possible before technology use became an important part of the teaching strategy

I mean I have run those audio clips in lectures before now where all the students are together doing it and then you know they listen to it they write and then they talk to *their neighbours about it. But the beauty of this is by having those if they didn't get it first time round they can go back to it and they can listen to it again. Can't do that with a real child but it gives them the practice that they need before they going to school*

Effectiveness of the design of this course site is measured by student performance and the assessment process is very visible to the student. Pedagogic strategies are affected by Claire's concern for student acquisition, and the evaluation processes are designed to be immediately relevant to the student

I was going to take you behind scenes for the submission centre as well. So the stuff comes in *at the back end. It's not as tidy as it could be. We've actually got it in units. It's irritating because I'd like it in alphabetical order. And it doesn't it comes in, in time order when submitted. So you pick it up, you mark it, you drop it back in there and then press the right button and it's sent back to their email address, and they can pick up the folder that you wanted them to see. And then you've got the record of this.... if there is a problem we can actually put a fail - 'this was a bit dodgy'. And this is whether they've seen it or not. So we've also gotta check on who's actually looking at things and who isn't.*

#### In summary:

The case studies in this category do not have strong relations with epistemology as with the previous categories, because of their horizontal structure, but there are strongly controlled



social relations that are key to both transmission of knowledge by the academic and acquisition by the student, and technology is used for this purpose. Teaching emphasises the development of generic skills in students, which is information finding, analysing and critical thinking etc. in order for students to develop the necessary skills to use the teaching resources so that they can engage with the structured social activities. It is this social basis of teaching that creates the perspective upon the topic, for some of the case studies this is less controlled by the academic than in others.

For this Tom, as part of his Business studies course there is a need to ensure that students have engaged socially and honestly as well as taking on the perspective that fits with the course

*So how do we design the assessment to make sure that they've engaged in those activities which tends to be a sort of portfolio assessment? But then also in terms of assessment, how do we know it's them that are doing it? So how do we build in something in the assessment that actually is then face to face and we know they are doing it? So we bring them in on a Saturday and do a short exam with them or do we actually come up and get them to do presentations (Tom)*

Whereas for Stella in Health and Social Care, there is a need in this course, for students to develop a particular language that teaches them to challenge authority

*I get them to read Durkheim and Weber and I've got you know some chapters of some books and I've got some articles and things, some stuff that I've sourced myself and it's basically fairly inflammatory and we talk very much about power over healthcare and it does you know and you get some talking and discussing and they can see how power is evolved and in that I made them look at their own disciplines and how they are so power lacking. I give them the stuff to read and it's guaranteed to incite.*

And for Christopher, also in Health and Social Care, once the discussion is underway students take control of the content of the discussion

*So they are really supporting each other and that's important. So for me to kind of back away as much as I can to let them get on with it as adults. But sometimes if they are asking a specific technical thing that his fellow students - they wouldn't know that's when I need to respond. But I told them I don't respond to everything. They've posted almost 600 discussions in this 13 week course. You know so I've read every one but I don't respond to every one and I've told them that yeah*

For students teaching is less visible than in hierarchically structured teaching, and technology is used as the way of providing access to resources that expose students to readings, audio resources or video's situated in the variety of languages that also provide a particular view of the issues and concepts inherent in the curriculum. This is known by Bernstein as developing

the 'gaze' (Bernstein, 2000, p. 165) and the assignment strategies are underpinned by the ability of students to apply the many languages in a vocational context and through a particular vocational lens.

#### **Section 4: teaching that specifically focuses upon the individual student in a knower mode**

This last group of case studies offers the greatest degree of variation in the way that they incorporate technology into teaching; however they do share a number of principles which centre upon a desire to change the consciousness of students, and encourage a change of thinking about themselves and their role as citizens and social agents. Teaching is constructed as an intra-individual pedagogy and the academic takes on the role of facilitator whose role is to mask the processes of teaching rendering it invisible as a way of developing the independence of the student. The pace of study and the content is weakened to different degrees, but is designed to reduce the possibilities of inequality by ensuring that content is related to the socio cultural context of the students, and exposes them to different ways of seeing and thinking. Technology is used in these case studies in order to explicitly weaken the boundaries between the everyday knowledge of the student and the rather more esoteric knowledge here at the university. Students are given a choice in how they wish to learn as control by the academic is apparently transferred to them. Technology sits uncomfortably in each case study and its place in the teaching strategy is unclear and largely undeveloped. Evaluation methods continue to be controlled by the university systems.

The results of the analysis of the three case studies are summarized below:

category	Rachel: Humanities	Mike: Education	Jack: Applied Professional Studies
Aims of technology use	the transmission of interdisciplinary, theoretical knowledge	the transmission of interdisciplinary, theoretical knowledge	Transmission of generic skills and competences <u>Recognition of what a web presence will be in the future.</u>
Description of the discipline	Interdisciplinary - academic discipline -	Interdisciplinary - academic discipline	Interdisciplinary - academic discipline
Classification of discourse transmitted through the use of technology	C- - everyday language Horizontal - interaction initiated and controlled by the academic – directed at the group for individual consumption	C- - everyday language Horizontal - interaction initiated and controlled by the academic – directed at individuals in a group	C --Mainly everyday language, directed at individuals and the programme group, focussed upon work based setting of individual student
Discourse structure	Exposing students to different socio cultural perspectives	Exposing students to different perspectives and ways of seeing	Horizontal - interaction initiated by the academic but strongly influenced by the experience of students on the programme
Framing of student input	F-  no discursive space for students  technology used to expose students to a variety of languages and perspectives  Made sense of in informal spaces away from the formal learning spaces	F-  No formal discursive space for students, technology used to expose students to pre designed content.  Made sense of in informal spaces away from the formal learning spaces	F+ - F—discursive activities initiated by the academic, then gradually weaker control over the discursive space as students populate and influence the direction of the discussion, plus space/time for support materials
Framing of teachers role	F++ Content controlled and delivered in a specific order, regulative rules based upon a desire to change thinking and perspectives	F++ Content controlled and delivered in a specific order, regulative rules based upon a desire to change thinking and perspectives	F+ - F++  discursive, interactional, social activities key to design of programme website  Regulative rules relate to collaboration and cooperation, as well as active engagement and a change in thinking
Framing of instructional discourse	F+ F-  Controlled by student group, views and values of academic central to teaching.	F+ F-  Controlled by student group, views and values of academic central to teaching.	F- - Controlled by students, views, experiences and values of students key to teaching. Content changes depending on student interaction

Table 11: results of coding activity

Illustrative case study:

Jack manages a programme that is designed for students who wish to plan and design their own degree in terms of learning outcomes, content and pacing. Students have control over all aspects of their study apart from the assignment strategy which is aligned to university systems. Jack feels that the very individual nature of study is problematic for the students and

plans to use technology as a way of introducing an intra- group dimension to the programme. The website is being planned still and so the following case study is reflective of how Jack recognises that technology may be integrated into the current system of teaching that consists largely of one to one tutorials:

*It's constructed (the VLE). I can show you. But we do have the bones of it constructed and it's taking some doing. So, the way we're trying to do is that, at the moment, we're operating outside of the university is VLE systems we are using Moodle.*

Jack has taken time to bring technology into the programme, because he is unclear about just how it may converge with the current systems of teaching:

*It's taking us a while because of time constraints. We decided that it would be better... we were originally gonna use web CT because it existed but because we're moving over to Moodle anyway...*

*... at the moment, at least and I'm not quite sure if this is gonna translate into the university system whether it will just be courses for students as at the moment with web CT*

Jack's beliefs about teaching present him with a vision of how structures imposed by the VLE will be relevant to his students

*But what we've got with our system is we've got an over-arching centre a work based learning Moodle area, which then links out into the various levels and then the various courses. And so, so what we're trying to do is for my students that work at different levels, I will try to give them a single area where there could be an exchange of information. And then, if the information that they want to exchange is more specific to the people in their own level or doing their own courses and stuff like that it can feed down into those more specific course areas.*

The language used by Jack places his students at the centre of his actions and he is confident that technologies such as social networking (Twitter and Facebook) will support the 'student centred ness' of his programme as communication and allow interaction to become central to the teaching strategy. Whilst, at the moment, students are reluctant to engage in communication in this way, he feels confident that if he can merge commercial social networking in a formal VLE site it should have more success:

*I just recently become fan of Twitter and I want... and it's a very easy way. Not many of my students did take the offer up They won't follow me. They won't... very few of them will actually, with Twitter. So, it just kind of died a death but I understand that you can link into Moodle from Twitter. And so, I'm going to do that, I'm gonna tweet directly into that. I'll tell you that, that one day would develop into students then seeing the value of it and then being able to tweet directly or either some form of, you*

*know, I'm hoping to start wikis where people can put bits of information and, you know, tips from, and discussion boards and stuff like that which I'm hoping for.*

It is important for Jack that the design of the VLE supports the process by which students develop and change their ability to think differently and engage with learning:

*Yeah, and I would hope it wouldn't just evolve from the point of view of the lecturers. I mean, we'd hope that this would be an input from the students. It could be, you know, in constraints, quite organic in a way. We'd like it to grow and with the people to become full of ideas.....and be able to incorporate ideas from students.*

Jack's strong beliefs about teaching are reflected in the value that he places upon supporting students to become independent learners, and so the design of the VLE must be congruent with this approach to teaching:

*That might be a slow process. But, yeah, that is something I'm kinda interested in. I want there to be student involvement and I don't want it to be heavily guarded, by the lecturers, or ruled by the lecturers so to speak. I was quite horrified when I went off to a Moodle course, and some lecturers, because of their attitude to students, was that *these people do not understand what's going on and that's why I'm here to tell them what's going on.* And I don't, this can't be further away from my style of teaching if it tried to be. I wanted to be, I mean, we are working with adults. They have as much right to shape their learning as we have to *shape their learning.* And so, I'm hoping that's gonna work in that way with luck it will work. We should do. I want it to be some form of ownership, you know, to use that jargon.*

Jack feels that interaction between students will enhance the programme, so much so that he would like to extend the notion of community by encouraging past students to continue to take an active role in support new students, in the way that Lave and Wenger (1991) describe a community of practice. He sees learning as a lifelong process and technology can be used to build a community that will facilitate the alumni as potential mentors:

*Because we also hope, perhaps, with a VLE, to form some form of APS (Applied Professional Studies) alumni. So, that we've got... we find a lot, I mean, a lot of my students ask when they're coming towards the end of their studies, any chance of a lecturing job, because I really liked this year,. I'm really hoping, that would be nice if students felt that they would like to mentor younger students or people that have done the program would like to be, you know, let themselves be available to give advice,.*

Jack works with students on an individual basis at the moment and is very aware of the possibility to conflate teaching, talking to the individual student about their personal work and assessment of their work, something that he feels is a problem. He feels that technology can be used to dilute the intense relationship of one to one teaching, with the inherent possibility of power imbalance, if students engage with learning by communicating socially

*Sometimes we get to evaluate students and sometimes, when we try not to, but I've certainly had tutorials where I said, "Oh come on, you know, you've got to back-up something like this." You know, and then the students go away thinking that has been a great disaster. You know these crises that so often happen. I'm also aware that students don't want to ask certain question of the lecturers because this came out in a tutorial recently, from one of the students, "Look I'm gonna have to ask you this question but I've been putting it off for ages, I really have to ask but you're gonna think I'm really stupid and I don't want you to think I'm stupid." So, I said, "Well, come on, tell me what it is?" And she told me, it was a good question actually.*

Jack feels that the interaction that happens in traditional university teaching that takes place in lecture theatres still has a lot to offer students and he feels that his students miss out by not experiencing such environments, and that he wishes to try to reconstruct such experiences through the use of the VLE:

*I mean, this is the kind of thing that naturally happens in, you know, more traditional type of degrees. It happened to me because we all sat in lecture halls; we all sat together and stuff, because this is not traditional. And, these are people from different work places and, you know, different fields. It's something that that's held back from them or they not, you know, that they don't get the privilege of, I wanna try to address that. It won't be perfect like this but it should be a vast improvement on what they've got, because it's really, really important to me.*

Jack is faced with an inherent dilemma in that he sees the benefits of integrating technology into his current teaching, but is unclear about how his beliefs about teaching can be incorporated into the design of the website. In order to be successful the structures that are built as part of the design must support the development of a wide variety students, with different motivations, into independent learners, whose thinking and values can change as they progress through the programme, and at the same time make teaching and social relations in the group much more visible. His concern is that autonomy for such learning will move from the student to the academic.

#### In summary:

According to Muller (2001) to learn without any boundaries is an ethical ideal, that is for students to be able to find information, make meaning to it beyond any immediate epistemological boundary and to go on to use their findings responsibly in work and life, having perfected such skills is a 'teaching heaven'. Whilst not new this has been the vision for technology enhanced teaching and learning policies for some time. The ideology emerges from the notions of social constructivism and reports that students who are able to use technology to good effect are able to explore beyond the boundaries of their course material

(Sharpe & Beetham, 2010) and ultimately be able to shape their own learning. The messiness of this kind of teaching is explored by the academics in this category and summarised below when academic S uses technology to help to situate teaching in the socio cultural context of the student group

Well one of the things that was so good about the technology was it was a very inter disciplinary course it was a level three core course for theology students but it was also for sociology students [IB] some criminal justice students and then quite a lot of students as elective for an option, so very diverse group. And it was a course that had began years ago as Theology very thoroughly theological and it had really grown into gender race and religion and the race component I had taken over fairly recently *and I was teaching at the same time as Obama's election. So the questions and the interest of the students were very diverse and the fields we were picking up on were very diverse so the technology was great for that, because it meant we could watch a bit of You Tube where they had James [Cone] talking about black religion and there were TV documentaries about religion in America in relation to the recession and the election and talking to black workers and church leaders in Detroit and things like that. We could watch a bit of video in class and then I could say this is an extra resource, things you can follow up and put them on Web CT. So that was one of the best uses of it.*

However as with the case study for Jack, Rachel also had problems in realizing the potential of technology for social relations between the students in this context

Using it for social networking and chat was something I just never quite got into that

The fact that the last case study is describing the way that Jack would like to use technology is significant, because he is having difficulty seeing the relationship between his own views and beliefs about teaching and how they can be incorporated into a website using the VLE. The other two academics in this group seem equally puzzled about the link between strongly held beliefs and a teaching system that appears to bring control into something that requires an absence of control in a traditional face to face setting.

Of course a lot of creativity is a question of connecting with the right doors. So I gave them lot of doors, if they wanted to go a lot further. So I introduced them to a lot of *authors about it and books on creativity. ....so you just connect with a few eclectic authors. Doors that, that if somebody turns them on they can go and read a lot more* (Mike)

Coding for this approach to teaching is weak classification and weak framing, in other words the content of teaching is blurred and largely dependent upon the student group, the language used in discursive spaces is everyday language as it is the students own situation that will determine meaning to content, therefore epistemic relations are weak. Student input in terms

of social relations is not controlled (weakly framed) as this is key to such teaching which can be likened to progressive forms of education and focuses upon the needs and development of the individual student in terms of skills and consciousness. The role of the academic is therefore harder to define, in that there is an expectation that they have the capacity to take a position, preferably radical and critical on many issues and maintain a relationship with the student that is largely based on a constant need to evaluate the individual student performance. This is based upon the students' ability to construct and articulate an argument and so generic skills are key to their development as 'knowers'. For Mike this requires some understanding of the physiology of thinking and consciousness

they learned about the, the importance of mood, the physiology, a little just a little bit *of you know right brain, left brain stuff it's not really* physiology but it does actually work. A little bit about group creative techniques such as brain storming so that they already had thought about how brain storming works, they would work with an idea *they've cooked up from brain storming and they were ready* to brain storm.

Jack finds this relationship difficult and would like to use technology to bring a sense of community that will encourage the tacit development of students as a result of increased interaction between them, both current students and alumni, which removes the power he feels because of the key role that he plays in evaluating their work and progress.

### In conclusion

Four different categories of teaching approaches using technology have been described and analysed in detail in this chapter. The case studies have generated a very detailed and complex picture of teaching practice with technology in the university and whilst the results continue to reflect the findings of the analysis about the beliefs and perceptions about teaching that were documented in chapter 4, I no longer see technology described as a way of getting things done. The concepts of knowledge and knower mode provided the initial categories as a form of cause and effect, which provided the base from which other themes could emerge as the analysis of the interview data progressed. The participants all discussed the values that underpinned their conceptions of teaching and these included the development of conduct and behavior of students conducive to a future employment context or to the development as a student in a local context, and in some cases both, therefore teaching that is projected towards a vocational context (or not) emerged as the next level of category. The ontological categories defined by Bernstein's theory were then used to structure the analysis allowing themes and insights relating to the relationships with students, in terms of power



and control that define the different approaches to teaching to emerge. What emerges is a spectrum of teaching activities from an approach that is strongly classified in relation to the knowledge that is to be distributed and strongly framed in terms of the hierarchical relations between the academic and students, to the final case study which represents a view of teaching that incorporates technology in order to weaken the classification of knowledge so that each student determines the knowledge that is relevant to them, and weakens framing so the students are able to take control of their learning in every way. All of the 13 case studies fit along the spectrum and I have used illustrative case studies in order to demonstrate the teaching that emerges from the respective coding structures, this I found very helpful as a way of bringing a language and rich description together

The case studies collected through the interview process reflect the real world, everyday use of technology as part of teaching that is intended to support student learning. They make a very valuable contribution to a study about the teaching practice of academics that regularly use creative and principled practice that combines disciplinary knowledge and the ability to transmit that knowledge in a variety of ways. For all of the thirteen case studies that were analysed in this study and it is clear that for the academics involved technology occupies a pivotal role in their teaching. Bernstein's concepts of classification and framing guided the analysis the distribution of power and control in teaching, as well as identify particular approaches to teaching and values communicated through technology.

The strong classification and framing, that characterised the case studies of those whose approaches to teaching fitted the knowledge mode, described teaching that required student participation in the learning of a 'coherent, explicit and systematically principled structure, hierarchically organised' (Bernstein, 1999, p. 159). In this context students learn the skills of research methods that sit comfortably in the discipline. Technology is used in order to support the individual student's development of this theory based language as well as specific skills related to analytic skills in the context of positivist research methods. In all of the case studies there is consistency between the academic beliefs about teaching and their actual teaching practice, in that the classification and framing coding did not change. Classification is weakened when the content of teaching has a vocational focus and the needs of a particular vocation field, such as engineering, have strongly influenced the curriculum, technology is used in this case to situate learning in the context of problems and skills of survival in employment.

The largest group of case studies belonged to teaching characterised by weak classification and strong framing. Technology is used in this context to help student to develop their academic skills and abilities in relation to active reading and listening, communication skills and information searching and management skills through the processes of active engagement. The content of teaching is largely based upon the consideration of a variety of segments of knowledge from multiple perspectives and opinions that are collected together, discussed and reflected upon, which is all set in a horizontal discourse structure that utilises everyday language. The academic encourages the development of these skills in students by requiring them to complete activities through relatively strong framing and control. In all of the six case studies in this category there is a lack of consistency between the beliefs of the academic about teaching, which they see as a process of transferring control to the student for the content, pace and sequencing of learning, and their actual practice which frames social engagement strongly.

When both classification and framing are weakened the content of teaching is contingent on the background of the students and relates to their personal and professional experiences. In this case students have apparent control of the discursive space as well as the content, pacing and sequencing of teaching. The role of the academic is to monitor and assess the student contributions, which introduces a difficulty for the academics as the principles that underpin their beliefs about the roles and identities of students and academics presents a number of barriers to the use of technology in teaching. For this group of academics there is consistency between their beliefs about teaching and their use of technology in practice, which is underdeveloped in the case studies presented in this chapter.

Innovative teaching could be defined in the context of this study as an incident when an academic is able to balance the mix of weak and strong classification and framing as a way of developing the student's skills and communication capability as well as their ability to integrate epistemic knowledge into their learning.

It is apparent for this analysis of case studies that 'habitualised' knowledge and practice have overridden the HEFCE 2009 strategy 'Enhancing teaching and learning through the use of technology' which is characterised by strong classification and framing suggesting that HEFCE has the power to drive forward change in universities. The academic, however appears to remain insulated from the policy either because they do not have the recognition rules or choose not to show that they have acquired the message that it transmits. This is for a

variety of reasons, but a lack of perceived autonomy and a lack of leadership in this area in the schools may explain why. Academics, whatever their preferred mode of teaching, do have a great deal of individual choice over their approach to teaching therefore framing is currently weak, in that the control is held by the academic. The policy requires academics to take on extra responsibility for the financial situation of the university and to make money through efficiencies and the commodification of education, something that this study has found little evidence of.

## CHAPTER 6 DISCUSSION OF RESULTS AND CONCLUSIONS

### Overview of the chapter content

The purpose of this final chapter is to draw together the findings from the analysis of the different sources of data that were collected as a way of describing a case of technology use in teaching in one university. The first task is to discuss the overall findings of the study and in order to do this I refer back to the work of Pinch and Bijker (1984) and the writing of MacKenzie and Wajcman (1999, re print 2010) as a way for providing a heuristic framework for the discussion and resulting conclusions. In the next section I break down the overall findings by re-visiting the findings of each chapter, as a way of showing how the ideas and principles that arise from each chapter fit together in this bounded case study. This is an important activity as the methodology used to direct the activities of this study have accessed everyday instances of technology use in a way that are not always predisposed to explicit cause and effect analysis.

The potential consequences for the research findings are explored in two possible ways, firstly by identifying the implications that they have for policy that directs the practice of academics when using technology in their teaching. Evidence for professional practice currently relies upon small scale, context specific case studies; this study however provides an opportunity to challenge the imposition of unproven practices that arise from a dependence on technological determinism. The study has provided an opportunity to create improvement to learning by allowing policy decision making in the university to be based upon relevant information that illustrates day to day teaching practice, rather than creating policy from ideology and political will. Secondly I have summarised the way that this study can add to what is currently reported in the literature on technology use in teaching in universities and finally how I shall ensure that the findings of this study are disseminated in the literature and locally in the university.

### Introduction:

The stated aim of this thesis was to explore the use of technology in teaching by exploring the everyday world of a university and to answer the following research question:

## **How is the use of technology shaped by the everyday teaching practice of academics in a university?**

by undertaking the following activities:

- A systematic review of the literature
- An analysis of the current HEFCE e learning strategy document (HEFCE, Enhancing learning and teaching through the use of technology, 2009)
- An analysis of interview data which explores the beliefs of academics about teaching and the contribution that technology can make to teaching
- An analysis of a particular example of the use of technology in teaching by the participants in the study

The thesis has achieved its aim of answering the main research question, guided by the two sub-questions:

- What is recognised to be teaching in the context of technology use?
- What is realised as teaching in the context of technology use?

The coding system that was central to the analysis used the concepts of classification (power) and framing (control) as described by Basil Bernstein in his last book 'Pedagogy, Symbolic Control and Identity' (Bernstein, 2000). By answering the question mixed pedagogic practice in the university is revealed, with strong and weak values of classification and framing depending upon whether teaching is focussed upon a knowledge mode of teaching, that is dependent upon epistemological relations or teaching is focussed upon a knower mode of teaching, which is dependent upon social relations (Maton, 2000).

Therefore, I shall finish this research study by discussing the findings and how they can be used to support the academic in their effective use of technology. Firstly I shall summarise the findings of the whole study and then summarise the findings of each chapter before I discuss recommendations that emerge from those findings as a whole.

## Technology and teaching: a summary of the findings of this study

Whilst undertaking this thesis I have read a great deal, some reading was necessary and practical and some was enlightening and gave me new insight into the problem and dilemmas that motivated the design of the study. One article that contributed to a chance but informative insight was that by Trevor Pinch and Weiber Bijker (Pinch & Bijker, 1984) then updated by Bijker at a later date (Bijker, 2010). These articles referred to a model known as SCOT – the social construction of technology which suggests that the way to understand the adoption and development of technology is through an understanding of users as agents of technological change, and that a different group of users will associate different meanings to technology leading to what Pinch and Bijker describe as ‘interpretative flexibility’. This led to reading the book ‘the Social Shaping of Technology ‘ (MacKenzie & Wajcman, 1999, re print 2010) and a realisation that key to understanding the use of technology in the university was to understand the users of technology in teaching also, and the relationships between them in terms of power and control (Klein & Kleinman, 2002). Whilst a great deal has been written from a student perspective, the SCOT model as described by Pinch and Bijker (1984) suggests that this does not necessarily infer that academics share the same views. This highlights the importance of the case study methodology which attempts to bring the perspectives of academics and the impact of innovative use of technology on students together. This thesis adds to the current knowledge of technological change through an analysis of case studies using Bernstein’s concepts of classification and framing as a way of analysing social relations when using technology in teaching, this included published case studies analysed as a literature review and those contributed by the participants of this study.

Published literature suggests that there are a number of theories about what it is that shapes the use of technology effectively and these include (MacKenzie & Wajcman, 1999, re print 2010, pp. 3 - 27):

- Technological determinism
- Economic shaping of technology
- Science and technology are closely linked
- Technology is socially shaped

I shall be guided by these headings as I present a general overview of what I found by conducting this research study.

There is little evidence in this university of any kind of seismic change as predicted by the early pioneers of e-learning such as Diana Laurillard, Betty Collis, Tony Bates etc but teaching approaches are more likely to be guided by a set of values that are linked to beliefs about teaching as a discursive activity and the social order of the university that determines the behaviour and conduct of students. The assumption had been that as personal computing expanded and the power of micro processors increased so teaching would change accordingly as it embraced the tools that technology offers, in particular its ability to promote communication and information flow. Clearly there are many ways of using technology for teaching, but evidence from this study suggests that academics have linked traditional methods of teaching to technology use.

This situation is not unusual; over time, there have been many examples of illogical ‘dynamics of choice’ (Arthur, 1999 (reprinted 2010), p. 107) in technological adoption and writers have drawn attention to the disparity between the potential of technology and the reasons that people use it. Examples include gasoline as an inefficient way to power cars as opposed to steam or electricity - something identified in 1890, the QWERTY keyboard and driving on different sides of the road meaning that cars have to be manufactured with a steering wheel on different sides for different countries. There is plenty of evidence in teaching also, such as the extensive use of email between students and academics when much more efficient communication systems exist.

As a driver of technological adoption technological determinism is an important one, and I have found that some of the facilities that technology offers, in particular communication tools do direct the activities of academics, however, there is little evidence of a free and open flow of communication that can be seen so easily in the general use of Facebook or Twitter, however, for some academics the possibility of realising such potential for teaching remains a fundamental goal. Another driver for change is a naturally anticipated relationship between science and technology with an expectation that some academics would be much more skilled

in the use of technology and be able to develop artefacts for their own use. I found little evidence of such a relationship and in reality, epistemology and the distribution of a systematic, hierarchical body of knowledge are crucial in driving the approaches to teaching in disciplines such as science and engineering. Not all knowledge in these disciplines is applied, and student activity is often concerned with learning a complex language in order to engage with the theories and discourse of the community of academics in the discipline. The study did find some evidence that engineers have attempted to establish technological resources through software design, however, frustration with the resources available as well as the lack of a business- like approach to supporting the use of technology in the university were reasons given for not extending this activity.

Educational policy, such as the HEFCE 2009 strategy ‘Enhancing teaching through the use of technology’ suggest that economics should be a driver of technological changes to teaching. However, amongst those interviewed for this study, I found that whilst academics were aware of the vocational future of their students, there was no evidence of technology being used for enterprise or efficiency reasons. There is evidence, however, of change to teaching as a response to computers and mobile technologies as an inextricable part of the everyday life of students. All academics could see the benefits of students accessing teaching outside of the controlled timetable and teaching spaces in the university and were keen to promote freedom of access to materials anytime, anywhere. A limited range of technological tools are actually used by the academics in this study although many have considered artefacts such as second-life and web 2 tools. However, as a group, they are satisfied with a small set of tools that work for them; this does not necessarily imply experimentation and the innovative use of technology. I found little evidence that processes or policies that promote market ideology have led to the most advantageous use of technology in teaching and the strategies developed by academics are linked to traditional teaching practices that are established as part of the university system.

My observation therefore, is that technological innovation is socially shaped and the rewards for such changes probably depend upon fulfilling the norms of the strongly framed assessment system of the university with its focus on student performance. If academics want to design a new approach to teaching it means having to work with risk, with little in the way



of research evidence that it will work and as rewards for academics tend to be linked to student satisfaction it becomes complex and difficult to assess the impact of such approaches. I suggest that there is no single shaping force as technological change is guided by the values and beliefs of the academics that use it and what is best for some academics is not necessarily the best for others, which may not be the best for the managers or educational developers.

However, I have found that adopting technology in teaching does extend existing teaching practice, but there is a need to find a way of talking in detail about change and the impact that technology has upon teaching practice and students. The processes and activities involved in teaching with technology are complex and easily contested and academics have to spend time debating the characteristics of different technologies and the likely effects in their environment, and as stated earlier complexity and uncertainty lead to low-risk approaches. This thesis begins the process of developing a language that will allow discussion and discussion about change to practice, through a greater understanding of the everyday use of technology in teaching in one university, and clarity is brought to that understanding by the extremely worthwhile addition of the theory of pedagogy as described by Basil Bernstein.

I shall now attempt to answer the research question by reviewing the findings described in each chapter of this thesis and then concluding with recommendations that emerge from the final answer.

### The chapters of the thesis and the contribution of each to the overall findings of the study

#### Chapter 1

In this first chapter I introduced the complexities of technology use in university teaching, both in terms of defining technology and its relationship with the work of academics. This is compounded by the difficulties created by limited evidence that technology has any effect on teaching in universities. This is argued to result in a rise in popularity of the case study methodology as a way of describing and analysing the effects of small-scale initiatives as a way of sharing teaching practice in this field. Because of the difficulties inherent in case study research and the problems in obtaining common themes the use of a theoretical

framework is considered to bring structure and coherence to respective analysis of those published in the research literature and those gathered as part of the data collection processes in this study. From my reading of Bernstein's books and a number of studies that used his coding methodology I developed a model of analysing case studies that aimed to bring clarity when exploring different approaches to teaching.

This model incorporated the concepts of recognition and realisation, that academics can recognise the potential effects of teaching with technology but reality may be different and in order to understand how technology is shaped it is necessary to understand the power and control relations between those who use it, in this case between academic and students (Klein & Kleinman, 2002) and concepts of classification and framing were also an essential part of the model. The model, therefore, aimed to make explicit links between the design of the study in relation to aims and research questions, and methods of data collection and analysis of that data.

## Chapter 2

Chapter 2 analysed a series of case studies published in the literature with a specific purpose of contributing to answering the research question and testing the use of the coding system. I found the systematic methodology immensely useful as it allowed me to try to aggregate collections of innovative uses of technology from academics in universities around the world, and then to come to general conclusions about the findings. I am exceedingly grateful to the members of staff at the EPPI centre at the Institute of Education for their support in this. In order to undertake this approach I attended one of their courses 'Synthesising evidence for policy and practice', and they encouraged me to consider the rigor and clarity of the review and to develop a strict methodology.

The resulting review explored several different uses of technology in specific examples of innovative teaching in universities. By taking the risky step of analysing case studies, I was able to contribute to answering the research question by extracting common themes from them. One of the key findings to emerge from the analysis was that student satisfaction with

technology in teaching tended to be highest when the teaching followed a conservative approach to teaching and that evaluation processes inherent in assessment tasks were visible and explicit. Students were able to recognise learning in approaches to teaching that used innovative and different technological artefacts, but were not necessarily able to realise that learning into the texts, e.g. essays and exams etc. that are demanded by the rules of a strongly framed view of pedagogy in the institutional quality and assessment systems.

This review confirmed for me that it was necessary to examine the relations between the academic and student in terms of power and control and that recognition and realisation rules are crucial. Clearly technology alone is not shaping the actions of the academic or the response of the student, and this confirmed my desire to set the study in a critique of technological determinism. The recognition and realisation rules were applied in this literature review to the student context; however, I felt that the same principles applied to academics and felt confident in transferring the rules to the interview coding system.

### Chapter 3

Chapter 3 was probably the hardest chapter for me to write, policy analysis is a specialised field, and I needed to learn about this as a methodology. My first thought was to examine the 'Enhancing Teaching and Learning through the use of Technology' strategy document (HEFCE, 2009) through a teaching and learning lens, using the coding system to analyse the proposed relations between academics and students. I anticipated that the policy would support a weakened classification, with employers and the government becoming increasingly prominent drivers of teaching methods and the content of teaching and weakened framing as the student is given greater control of what they want to learn and how they are to learn it. However, I soon realised that I needed to learn more about economics as the document only made sense when I approached the analysis from the perspectives of 'New Institutional Economics', as described by Schumpeter (Prendergast, 2006) a long time ago. This also involved learning 'neoliberal language' and, as a result, I came to the conclusion that teaching is invisible in the strategy and the identity of academics marginalised to someone who needs to be educated for specific activities with reduced autonomy over their teaching.

Economics and a drive for technology to be used to improve efficiency and to increase enterprise activity in the university dominate the recommendations of the strategy, along with the possibility of increased governance and surveillance involving the QAA. Such a regulative framework and the rules and sanctions that emerge should produce a strong driver for organisational change. However in the interviews with academics in the university there was no evidence that this policy has any effect on the day to day use of technology at all. In fact, a lack of quality assurance mechanisms for e-learning and teaching using technology was highlighted by some of the academics interviewed. The strategy also suggests that a centralised system to manage technology use in teaching is required; however, again there is evidence in the interview data that pedagogy is managed primarily through the professionalism and hard work of the academic, which is firmly set in the regulations and rules of the quality systems of assessment.

#### Chapters 4 and 5

The questions that structured the design of the interview divide the resulting data into the two sections. In chapter 4, I present, analyse and discuss the responses from the questions that aimed to elicit views and beliefs about what teaching meant to the participants and how they perceived that technology contributed to their teaching. The findings are contextualised in relevant research literature and can be categorised in two modes of teaching which are the knowledge mode and the knower mode. This finding did surprise me as the interviews seem to include such a variety of views about teaching, but the idea of a binary system of teaching fits with other research in the field of higher education. However, other binary systems tend to code teaching in constructs of judgement, i.e. student centred and teacher centred, but as I continued to explore the findings of the interviews as a whole I realised that teaching does not fit easily in one category or another. In other words, all teaching is inherently social and all teaching requires the dissemination of knowledge, the key is whether this is set in a vertical structure of knowledge or a horizontal structure, and whether there is an external focus, i.e. to a specific vocational field or an internal focus, that is a set of values that direct the behaviour and conduct of the student directed towards an imaginary vocational field, and the chapter discusses the importance of different teaching practices that emerge depending on these structures and foci.

Technology is recognised to contribute to teaching largely in a context of communication, dialogue and interaction. How much discursive space is controlled by the academic or the student will depend upon beliefs about teaching which can be described in a knowledge mode or a knower mode. Bernstein's coding system gave rise to five themes that emerged from practical experiences of using technology. I feel confident now that it would be possible to work through such a coding system with colleagues as a means of identifying how close to the desired instructional techniques and values systems their actual approaches to technology use are, this is particularly relevant to discussions about student responses.

Chapter 5 is the biggest chapter, and the coding system gave rise to a range in which approaches to teaching will fit, from strong control over all aspects of pedagogic discourse to no control. Case studies were used to illustrate the different coding outcomes, demonstrating how that spectrum can then be broken into four segments, and again the fluidity of knowledge and knower modes and the importance of them to the specific context are clear. The important theme to emerge from this chapter is the importance of vertical and horizontal knowledge structures, the context of their application and how they affect the approach to teaching taken by the respective academics. Of particular interest was the importance of the personal values of the academic and how their instructional discourse was set in beliefs about student conduct and behaviour.

#### Implications of the findings from the study for policy construction

The broader aims of this study are to explore how the findings can make a possible contribution to the development of teaching with technology in the university. In this context there is a need to understand how the micro processes of change to teaching can influence the macro processes of institutional change and vice versa. This insight is especially valuable as the university teaching and learning strategy is currently being rewritten. The use of Bernstein's theory has helped to examine the way that colleagues use technology in their everyday teaching in significant detail and has given insight into their expectations about their role and needs, as well as the resources that are seen to be important. The academics in this study have a great deal of choice in the way that they use technology, however

instrumental models of pedagogy, such as teacher centred or student centred pedagogy, fail to provide an adequate insight into the social context for their actions, as well as the values that underpin choices and actions. However, the study has also provided insight into how the academic negotiates the strongly framed regulative discourse from university assessment policies and how this weakens their control over technology use; the participants in this study expressed feelings of diminished autonomy, because of a lack of resources, such as time, and a lack of evidence, experience and skills . The study has also highlighted a desire by academics to share the processes and difficulties with senior management

The implications of the findings from this study for a future technology and teaching policy are discussed therefore under four categories, which are academic expectations in relation to:

1. Enjoying teaching
2. Resource allocation
3. Ongoing education
4. Strategic direction

**Implication 1:**

- There is a need to recognise the ordinary and what drives and motivates academics in their use of technology in teaching,

Most teaching in the university is set in the ordinary every day world of the academic and student. Understanding that world is important in order to change practice and there is a need to understand what drives and motivates academics in their use of technology. Not all motivating factors can be controlled, for instance the participants in this study talked about their use of technology practically and without exception all of the participants described a strong sense of pleasure when using technology in their teaching. Whilst not developed as a concept by Bernstein in his theory of pedagogy he accepts that the effects of pleasure should be taken into consideration as part of the analysis. Davies argues (2004, pp. 44 - 45) that students and teachers do bring a level of ‘indeterminacy’ when attempting to analyse their actions and draws upon Lacan’s concept of ‘jouissance’, as a way of capturing the pleasure that comes from both teaching and learning, something that is difficult to analyse and articulate. Davies goes on to explain that Lacan describes two forms of pleasure, the first is caught up with the reproduction of social order – desire, and the second associated with drive and makes no reference to social order at all – enjoyment. The participants talked about the

pleasure that they feel when using technology as a form of desire and a form of enjoyment. For some there is the desire to push forward professionalism

*I get excited by finding new ways of teaching. I like the innovative side of things. As soon as I see something that's got potential for teaching and supporting a learner I get excited about it. I also tend to be at the forefront of doing these things and which is possibly why I'm doing the job I'm doing. But no I see possibilities in things where other people see as being potentially hard work. And I will also have a good go at it*

Whereas part of the pleasure for the next academic lies in the enjoyment of working with technological artefacts:

*The other thing is, I have a love of computers, you know, I like technology. I've got my phone, you know, we're connecting and sometimes there are things that these, that you can pass information around, it's fabulous.*

For those academics who use technology with the context of the knower mode, with strong social relations built into the design of the website the pleasure comes from the social interaction created by the use of discussion boards and chat facilities:

*So for me I think that's one of my strengths you know you know getting the students to engage with me about the content. You know and me listening to them and helping them develop individually so...so I translate that same thing to online where they can't see you but you need them to engage with you. In this MBA course we have an activity about peer feedback and reflection and the amount of online activity was fantastic.*

In contrast however, for those academics who teach in the 'knowledge mode' the notion of pleasure is different and comes more from the epistemological relations rather than social relations and sometimes the use of technology removes the pleasure of engagement with the students, and feels awkward and unusual as academics have to extend their normal teaching environment:

*It's a self-confidence thing rather than an ability thing I guess. Like in a sense that, because I probably still consider teaching as standing up in front of a group and imparting knowledge.*

And for the next academic there is nostalgia for the classroom

*I wouldn't say it's any easier than teaching in the classroom because I wouldn't wanna lose the classroom communication. Because I think to have that feedback from the students is also important. The face to face contact is important to me as well. And the, what would you call it the informality of teaching as well. It's not just about education it's about meeting people. And I think that's why a lot of students you know that they have all these [IB] and [IB] they still want to come into university cause it's a meeting point that they can share with other students. I think it's important for*

academics to share with the students as well and for the students to be able to share with the academics. See them, talk to them informally.

As described in chapter 4 the most likely reason that an academic will integrate technology into teaching is for the purpose of communication, there is no pedagogy without communication, and when teaching fails to work it is pedagogic communication that is often blamed (Davis, 2004, p. 46), and academics will search for a suitable and effective alternative. However, as seen in chapter 5 the structures of knowledge and knower modes of teaching are powerful shapers of communication systems. And it is anything that gets in the way of this that will be problematic for the academic, and take away the pleasure of teaching with technology and may decrease the use of technology for the purpose of communication, reverting to email and increasing the number of face to face meetings.

### **Implication 2:**

- To recognise that workload, time and conflicting roles will affect technology use

There is a considerable body of literature that discusses the relationship between an academic's conceptions of knowledge and the affect that it has student learning (Kember & Kwan, 2000) (Entwistle & Walker, 2000) , most of these studies place emphasis on the need for academics to change their approaches to and conceptions of teaching. Several studies discuss the difficulties of creating cultural change in the university (Kirkwood, 2009) whilst others identify the many conflicting directives in the institution, including: - group work and social learning, teaching of employability skills, feedback to students etc and of course the use of technology and the VLE (Fanghanel, 2007). Others found that academics had to face numerous issues that impinge on their teaching as well as being encouraged to adopt different approaches to teaching, often with little in the way of supporting evidence (Lea & Callaghan, 2006). The conclusions of these studies suggest that if teaching is to improve there is a need to understand the effects of the wider institutional environment. Barriers to development in teaching for this group of participants included, for instance, the time that it takes to produce learning materials:

*Well, I am very, sort of, interested in things like virtual environments, like second life and stuff. But I've actually come to the conclusion that the students won't really engage with it... because I tried to engage with it and found it really hard. The reason why I was looking in that, in the first place was, because I can quite easily visualize a sort of case scenario where a student avatar would go into a room and see*



*a patient and will be... will pop-up from a medical history, then they'll go to the LAB, choose the test. Get the result and then come to a conclusion and diagnosis. And, I don't think the students would necessarily get involved in it, and secondly, have taken huge amount of time to set it up and then get it running. So, the technology hasn't really helped on that front.*

And there is little confidence that the resourcing of such activity is understood by those in management positions in the university

*Well it has to be resourced so that you have the timetable to prepare things properly. The powers that be don't seem to realize it can take you three times as long to prepare for an online course as for a lecture the following week, and without some of that preparation I think students are poorly served. And it's not a case I think once you've got all your materials prepared you don't need to invest as much time that's not true. You have to update you have to review. You have to do all the things that you do in a face to face course. So you have to invest time but that could be time that's... or resources that's taken from somewhere else and it's cost effective to not be in a classroom. And it's cost effective not to have your individual exam room it's easier to do it online.*

In chapter 4 it is reported that there is a common feeling amongst academics that teaching with technology reduces autonomy largely because of the time that it takes to develop resources which is not recognised in deployment. Promoting the use of technology in teaching should increase agency, through processes of creativity and professionalism, rather than diminish it and there is a need for academics to have a greater say in the way that time and resources are allocated for such activity.

### **Implication 3:**

- Recognise that CPD activities have to align with the actual needs of the academic

The importance of professional development for academics in HE is not disputed, however often such development concentrates on the technology rather than pedagogy (Kirkwood, 2009) and the reasons why academics don't use many of the tools available to them is not really understood or analysed (Blin & Munro, 2008). The reasons for academics not adopting particular technologies in this study was because of a lack of competence in some cases

*The other thing is getting up to speed with the skills that we need in order to be able to... because the Moodle is a bit mystery to me at the moment. And, it's time, which is why it should have started running by January, and we've got the bones of but it's not been populated yet and it's not... So, that's a bit scary for me. No colleague has any experience, so the whole department is experience free. If anyone has experience, it's me. I did a little bit in web CT, and designed a course in web CT and which was never used. So, by the time I got the experience, I'm fairly confident and sure with computers.*

But also because of a sense that academics need to adapt to particular approaches to teaching that doesn't always fit with their experiences and therefore the motivation to learn may be low

*Problem we have is that one is best practice and one is the variety. And it comes to the University or any academic constitution, there's lot of freedom. Our freedom is good and bad. Freedom enables creativity but at the same time it creates anarchy as well. To boost learning in this environment what we need to do is to decide what best practice in that field is. I'd like to see feedback about what would work.*

There appears to be a misalignment about the timing of educational activities in that individuals need to be educated at the time that they will use the technology, or everyone must be trained in order to support the growth

*Training has to be organic. What's happening is that the training was coming in as one chunk. If you gonna bring one chunk then it should be like an industry we have training session, next day you use it. Is that going to happen in the University? No. If that's not going to happen then everyone has to be involved in the growth of the system*

The study identified that individual beliefs about knowledge and knower modes of teaching tended to set the context for the academic when designing their resources. The importance of both modes is also identified in the study, and therefore there is a need to support academics in the development of skills and approaches to teaching that may (and may not) sit comfortably in their perceptions and values about teaching, so an academic who is using the knowledge mode may need support in the development of a greater discursive space for students. Whilst the academic who concentrates on a knower mode of teaching with greater level of emphasis on the skills and activity of the student may need support in bringing suitable content into their teaching as way of bringing all the segments back together into a cohesive whole. There is a need therefore for CPD activities to recognise the importance of different approaches to teaching but with support at the point of design, then during delivery and at the point of evaluation. Participants in the study tended to refer to colleagues for help rather than any central support team perpetuating a local context approach to design.

#### **Implication 4:**

- Recognise the need for an integrated strategic approach to technology use in the university

This thesis found little evidence of effects of the current HEFCE strategy (HEFCE, 2009), and there seems to no obvious evidence of policy affecting every day practice:

*Why is it not being enforced? Because some lecturers say that I won't do it because I prefer this way, but that's confusing for the student because we are looking at it from whose perspective, the action is not for me and it's for the benefit of the students...*

There is a tacit expectation amongst academics that responsibility for managing teaching should be shared with the university and school senior management teams (Marshall, Orrell, Cameron, Bosanquet, & Thomas, 2011) .

Probably the most important finding of this study is that the HEFCE strategy has had very little influence on the technology use in teaching in this university, at all levels. Instead the policies linked to the traditional assessment activities of the institution continue to shape technology use. This is not new and is fully documented by others (Kirkwood, 2009); however there is a need for policy to recognise the notion of expertise within heterogeneous groups of academics, whose values and beliefs are linked to epistemology. Teaching and learning strategies are usually epistemologically agnostic (Beck & Young, 2005) and yet this study found an explicit link between conceptions of teaching and learning and the epistemological beliefs of the academics.

This gap between policy and the world of the academic presents the greatest challenge to change within the university. Technology was perceived to reduce a sense of professional autonomy by the participants in this study and yet each academic appeared to retain control over the content and approach to teaching. It could be argued therefore that autonomy is retained through strategies of ignoring policy and leaving decision making to others, a phenomenon which is supported by other studies (Cox, McIntosh, Reason, & Tererizini, 2011).

Findings from the analysis of the interviews suggests that conceptions of knowledge and teaching , which are probably shared in small groups and disciplinary contexts, directly affect approaches to teaching and this in turn affects and shapes student expectations about teaching from a very early stage in their learning career (Prosser, Martin, Trigwell, Ramsden, & Lueckenhausen, 2005). There is a need to review the institutional rules and regulations in order to promote change in teaching and this relates, most importantly, to the assessment processes also, as all participants in the study stated that there is a misalignment between teaching and assessment, and yet as a system it is a powerful driver of student conduct.

### Limitations of this study:

When I set out to undertake this study I wanted to explore how academics use technology in their teaching and what happens to their teaching in the process, but as the study developed I realised that I was asking colleagues to risk exposing themselves and their views and beliefs in my research. By opening up and allowing themselves to be known they have allowed a great deal of learning about the subject and in greater depth. I am aware that the main limitation is that this is my interpretation of their stories about their practice, and at times I was aware of a long and lonely journey. However it has given me a chance to make sense of my own experiences and of colleagues' experiences in a new and different way. I have used their narratives explicitly, particularly in the construction and analysis of the case studies and have been very aware of a need to present my interpretations sensitively and accurately.

One of the main limitations is the fact that this is an exploratory study, set in one university and therefore generalisation to other settings may be questioned. I feel that the use of many sources of data including research literature, policy document, and interview data of beliefs about teaching as well as actual practice does enhance my attempt to persuade the reader of the importance of the findings. The use of Bernstein's theory of pedagogic practice I found very useful and confirms and brings clarity to the interview data analysis.

One of the key aims of the study was to explore teaching across the university by interviewing participants from all schools, I was not able to interview anyone from Computing and Mathematical studies, and this is a limitation to the study. A contribution from a colleague with expert knowledge of technology would bring an important dimension to the knowledge and knower mode findings and of course the contribution of technology to teaching. I was also unable to access the school of Architecture, which again adds to the limitation that not all schools were included in the study.

The study presents a theory that proposes a new way of understanding technology use and a language through which changes to teaching can be discussed and explored, however a limitation is that it is a small study and the findings would benefit from further testing in different institutions and with different groups of academics, such as those who do not enjoy using technology in their teaching. Only academics that are known to be enthusiastic about

the use of technology were asked to participate in the study and clearly extending the study to include other relevant social groups would add to a theoretical explanation of technology use.

The coding system analyses teaching in relation to power and control, in particular to the control of student activity. The effects of such control are not explored in this study and again the findings would be greatly enhanced by talking to students about their beliefs about teaching and technology in the context of a sociological theory such as that of Basil Bernstein. This would allow greater understanding of the effects on them of some of the activities that place a great deal of control for their learning with the academic or with them as students responsible for their own learning, i.e. visible pedagogy and invisible pedagogy. The absence of student feedback on different teaching approaches is a limitation and would bring considerable richness to future studies.

### Contribution to learning

I feel that this thesis contributes to professional knowledge in the field of technology and teaching, most particularly because of the use of a social theory that aided the development of a coding system that allowed a unique exploration of professional practice. The study has 'lifted the lid' on pedagogic discourse and provided an insight into the effects of teacher beliefs and practice when adding technology to their teaching.

The application of Basil Bernstein's coding systems, including recognition and realisation rules and the codes of classification and framing have enabled an analysis of the pedagogic discourse that emerges from different approaches to teaching. This challenges the notion that change to teaching and learning in university is driven by technological determinism and suggests that technological changes are socially shaped. My specific contribution to professional practice has also:

- Brought a new perspective to the literature on technology use in university teaching. This adds to the extensive literature about student experiences of technology and teaching and enhances understanding of how technology is shaped by students and academics in a teaching and learning relationship
- Collected and analysed unique data and case studies from academics which reflect every day use of technology and adds to the extensive collection of published case studies of innovative and unusual uses of technology in teaching

- Adapted Bernstein's coding systems in order to guide all aspects of the study, including the collection and analysis of documents and data
- Constructed and tested a framework that allows for an analysis of pedagogic discourse in technology use by academics and proposes a method for monitoring changes to practice as a result of different uses of technological artefacts and approaches to teaching
- Drawn on the concepts of vertical and horizontal knowledge structures from Basil Bernstein as well as internal and external relations which provide a base for new initiatives such as employability initiatives. The possibility to discuss the embedding of different value systems in teaching will allow for greater fluidity between competing initiatives
- Clarified the power and control dynamics between teaching that relies on epistemic relations and teaching that relies on social relations and shown that both are important and both control student learning processes but in a different way
- Given an opportunity for academics to discuss their concerns about professional issues such as autonomy, resources and the future of teaching

#### The contribution to my professional development

The contribution of this research study to professional practice so far is summarised in table 12 below. This covers the time that I have been engaged in the professional doctorate in education and aims to demonstrate the development of skills and knowledge of the field, but most importantly the confidence to share my knowledge with other practitioners. It is my intention to publish aspects of this thesis in relevant journals, with the specific aim of promoting best practice when using technology in university teaching and most importantly to promote good teaching. I shall also encourage others to recognise the importance of different approaches to teaching, rather than promoting a 'simple one size fits all' or a binary view of teaching constructed around notions of good and bad, or traditional and contemporary teaching.

Publications:

<p>Jump. L &amp; Jump. R, (2006) Learning academic skills online: Student perceptions of the learning process. Proceedings of the First International LAMS conference: Designing the Future of Learning, pp 45 – 54, Sydney. LAMS foundation.</p>
<p>Ryan, Malcolm, Jump, Lynne, Cealey Harrison, Wendy and Headington, Rita (2009) Listening to our learners' experiences of e-learning: a pre-requisite for innovation. In: EDEN 2009 Annual Conference, 10-13 June 2009, Gdansk, Poland . (Unpublished)</p>
<p>Jump, Lynne, Ryan, Malcolm, Cealey Harrison, Wendy, Headington, Rita and Tainsh, Yana (2008) Experts on e-learning: insights gained from listening to the student voice! In: The 7th European Conference on e-Learning, November 5th – 7th 2008, Cyprus.</p>
<p>Jump, Lynne, Ryan, Malcolm, Headington, Rita and Atkinson, Mandy (2008) Exploration of the student experience of e-learning: beginning to bridge the learning divide. In: ALT-C 2008 Conference: Rethinking the digital divide 15th International conference, September 2008, Leeds, UK.</p>
<p>Jump, Lynne, Jump, Richard, Gill, Anne and Stacey, Christine G. (2008) An analysis of masculine and feminine writing in postings in a series of health and social care on line undergraduate courses. In: Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications (EDMEDIA) 2008. Association for the Advancement of Computing in Education (AACE), Chesapeake, VA, USA, pp. 1040-1049. ISBN 1-880094-65-7</p>
<p>Jump,L., Jump, R., Gill, A., (2009) Learning in Context: Using the Concept of Community of Practice as a Framework to Evaluate an Online Masters’ Programme. Proceedings of the IADIS International Conference e-Learning (pp31-35) Portugal</p>
<p>Jump, Lynne (2011) Why university lecturers enhance their teaching through the use of technology: a systematic review. In Learning, Media and Technology. Vol 36, Issue 1 pp 55 – 68</p>

Table 12: Personal Publication list

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## **APPENDICES**

**APPENDIX 1: Participant information sheet and consent form**

**APPENDIX 2: Synthesis grid of the chosen articles for the literature review reported in chapter 2**

**APPENDIX 3: Copy of the HEFCE 2009 document: Enhancing Learning and Teaching through the use of Technology**



## **Participant Information sheet**

You are invited to participate in a research study of the experiences of University Lecturers who use technology as a way of delivering teaching. This research is being conducted to fulfil the dissertation requirement for the Doctorate in Education here at the University of Greenwich.

### **The research study:**

For this research, I am asking that you agree to participate in an interview of no longer than one hour, to be conducted in a location of your choice. I will ask you to talk about your experiences of using e learning and how you decide to choose particular online teaching methods. The interview will be recorded, and you will have an opportunity to review the transcripts of your recordings to make corrections. After we have completed the interview, and I have analysed the results, I shall share with you the narrative that I have constructed from your interview transcripts and ask you to check the accuracy of the representation of your experience. You will have an opportunity to respond to my observations.

### **Risks**

The interview schedule is designed to minimise any discomfort to you. However, discussing your experiences might cause you unpleasant feelings, such as anxiety about teaching in this way, and if at any time you feel uncomfortable you are encouraged to request a break or to terminate the interview.

Please be aware that the university staff counselling service is available to you, to book an appointment or for further information on Staff Counselling contact:

Christine Ojera on: 0208 331 9154, email. [c.ojera@gre.ac.uk](mailto:c.ojera@gre.ac.uk)

### **Benefits**

The main benefit of participating in the study is that you will be given an opportunity to contribute your experience and understanding of using online teaching methods. In reflecting on and sharing your experiences you will be contributing to the awareness of the complexities of being a lecturer and using technology to teach and communicate with University students. The study will aim to contribute to policy making and to inform service provision.

### **Confidentiality**

Every effort will be made to ensure that the information you share with me will remain confidential. My dissertation supervisors will have access to your interview data, but your name will not be used in my dissertation, and all identifying information will be deleted or abridged in order to protect your identity.

## **Considerations**

Please know that your participation in this study is entirely voluntary. You may, at any time, decline to answer any question without having to give reasons for doing so. You may, at any time, request a break, terminate the session, or remove yourself from this study without having to qualify your reasons for doing so. You may withdraw from this research study with full confidence that any information that you have shared will not be included in the study. You will be given a copy of your interview transcripts for your records. If you decide to remain in the study you will also be given a copy of the research results.

## **Whom to contact**

If you have questions about this study, please call me at the University on extension 8100, or email me to [L.Jump@gre.ac.uk](mailto:L.Jump@gre.ac.uk)

If you have concerns or complaints about the study then please contact:

Prof. Patrick Ainley, my dissertation supervisor, at the University on extension 9534 email [P.Ainley@gre.ac.uk](mailto:P.Ainley@gre.ac.uk)

Dr. Jane Barnard, also my dissertation supervisor, at the University on extension 8897 email [J.Barnard@gre.ac.uk](mailto:J.Barnard@gre.ac.uk)

If you agree to these statements and conditions and you agree to participate in this study, please sign the attached consent form.

Thank you so much for your interest in this study

*Lynne Jump*

Consent form:

<b><u>To be completed by the participant</u></b>			
1.	I have read the information sheet about this study	YES/NO	
2.	I have had an opportunity to ask questions and discuss this study	YES/NO	
3.	I have received satisfactory answers to all my questions	YES/NO	
4.	I have received enough information about this study	YES/NO	
5.	I understand that I am free to withdraw from this study:	YES/NO	
	• at any time	YES/NO	
	• without giving a reason for withdrawing	YES/NO	
	• (if I am, or intend to become, a student at the University of Greenwich) without affecting my future with the University	YES/NO	
	• without affecting any medical or nursing care I may be receiving	YES/NO	
6.	I agree to take part in this study	YES/NO	
		YES/NO	
		YES/NO	
<b>Signed (Participant)</b>		Date	
<b>Name in block letters</b>			
<b>Signature of investigator</b>		Date	

**This Project is Supervised by:** Prof. Patrick Ainley, my dissertation supervisor, at the University on extension 9534 email P.Ainley@gre.ac.uk

Dr. Jane Barnard, also my dissertation supervisor, at the University on extension 8897 email J.Barnard@gre.ac.uk

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

Researchers	Year	focus	method	subjects	number	gender	location	nationality	age	level	findings
Shim and Guo	2009	Weblog use as an alternative to webct in MIS course in Business programmes	Likert scale questionnaire  Student ratings and perceptions	1 MBA class 1 business under grad class	181 respondents	103 Male 78 female	University onsite	Mississippi USA		136 under grad 45 grad	<ul style="list-style-type: none"> <li>Level of study not important</li> <li>More experience of using weblog more positive about it</li> <li>Helpful info, up to date info and judgement on performance affects student perceptions</li> </ul>
Lenne, Abel, Trigano, and Leblanc	2008	Self regulated learning in two environments designed to facilitate SRL Forums to encourage contribution to a Community of Practice	Numbers of student who accessed certain resources and in which order  Also questionnaires relating to student perceptions of environments.	Students of programming course Hypermedia course that adapts to user needs and personalisation of the environment	54 students	n/s	University onsite	French	n/s	n/s	<ul style="list-style-type: none"> <li>Tools for individual cognitive /conceptual development worked well and as predicted</li> <li>Social tools for collaboration and development of teamwork skills did not work so well</li> </ul>
Doughty, Francksen, Huxley and Leach	2008	Use in the context of dance le teaching specific techniques, improvisation and interactive practice Focused on student peer learning	General observations by the lecturers And general description of their observations	BA dance students	175 students	n/s	UK university on site	british	n/s	Under grad	Technology can enhance dance education, facilitated personal change through self observation, share findings with peers – more easily Also self reflection and analysis of performance Role of technology needs to be clearly identified in the creative process
Demetriadis Papadopoulos Stamelos Fischer	2007	Software project management course Use of questioning strategy to scaffold	Experimental controlled design. All students Epistemological belief profile	Computer science students 3 <sup>rd</sup> year	32	17 female	University on site	Greece	n/s	3 <sup>rd</sup> year under grad	<ul style="list-style-type: none"> <li>Students in the scaffolded group achieved higher scores in the concept knowledge questions.</li> <li>Students with scaffolded</li> </ul>

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

		and support case based instruction	Pre and post testing Post test student likes dislikes of learning experience - domain conceptual knowledge questions								<ul style="list-style-type: none"> <li>questions spent more time on task</li> <li>Perception of the task positive but very tiring</li> <li>Students EB profile affects learning in case based learning when cognitive load is increased by questions and prompts. (tentative finding)</li> <li>Simple EB found tasks much harder</li> </ul>
Delialioglu and Yildirim	2008	Comparing blended learning with traditional instruction methods for students on a computer networks and communication course	Control experimental design matched students in terms of ability and department they came from Achievement test, Attitude scale Course satisfaction form	Computer network and communication course	50	n/s	University on site	Turkey		??	<ul style="list-style-type: none"> <li>Students in both groups had similar results in achievement and knowledge retention</li> <li>No significant difference in the two groups in attitude and satisfaction</li> <li>Main outcome that students spent less time in class room in the blended course</li> </ul>
Ng'ambi and Brown	2009	Blending of face to face teaching with anonymous online interaction in order to extend student engagement and provide environment for collaboration and consultation	Case study and narrative analysis of online postings	commerce students introduction information systems course	610 (main study)	n/s	University onsite	Cape town South Africa	n/s	1 <sup>st</sup> year under grad	<ul style="list-style-type: none"> <li>Intended outcome of blending F2F with online interaction to extend engagement this purpose fulfilled</li> <li>Unintended outcome that the online discussion also highlighted what students regarded as important – acted as a formative evaluation of the course</li> <li>Anonymity abused by some students who used it to post insults to lecturers and other students</li> <li>Addressed the problem of</li> </ul>

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

											<p>social imbalance in multicultural classes – a safe space to empower voice less students, anonymity critical</p> <ul style="list-style-type: none"> <li>Allowed pedagogical and administrative changes to course as it went along.</li> </ul>
Shah and Cunningham	2009	Introduction of a VLE into a UK orthodontic training programme as an adjunct to established teaching methods	Semi structured interviews and open ended questions Questions for interview developed through engaging with focus groups	Course coordinator (1) Lecturers (2) and students (10) interviewed			Blended University plus VLE use at a distance	UK	n/s	Post graduate	<ul style="list-style-type: none"> <li>VLE a powerful tool for teaching and learning and to add administrative and personal additions</li> <li>Collaboration of resources and expertise can build a robust VLE and peer review helps.</li> <li>Students and lectures felt that it should be a mandatory part of the curriculum</li> <li>Changes the role of teachers and students which makes student more responsible for learning.</li> <li>Lecturers need to learn how to develop a supportive and guiding role in learning process</li> <li>VLE needs to be more engaging</li> <li>VLE cant substitute the process completely</li> </ul>
Kraemer	2008	Technology enhanced German course on fairy tales, aimed to integrate the teaching of language and	Qualitative multiple case study approach perception study. Pre and post surveys, interviews with students, videotaped class room observations	German language students	19	15 females and 4 males	University onsite	Michigan USA	n/s	4 <sup>th</sup> year undergrads	<ul style="list-style-type: none"> <li>More control by students over the class resulted in increased levels of engagement and interaction</li> <li>Students perceived their language skills had</li> </ul>

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

		literature through online activities	and classroom artefacts (assignments)								<p>increased (not formally assessed)</p> <ul style="list-style-type: none"> <li>• Pace of online assignments with students allowing to complete flexibly</li> <li>• 3 students disliked the course because of difficulty with the reading</li> <li>• Problems with format highlighted by students eg. Clarity of instructions, functionality of programmes, readings too complicated, lack of feedback from lecturers and too many assignments</li> </ul>
Mitchell, Ryan, Carson, McCann	2007	Drivers for webct use: increased numbers of students, mature students with family commitments, dyslexia and special needs amongst students, efficiency in distributing course materials. Nursing programme Rehab and Nursing older people module. Traditional teaching enhanced by web based materials	To explore student's views of web enhanced learning, and to examine patterns of access Focus group interviews Questionnaire Webct tracking data	2 x 6 students in focus groups Questionnaire completed by 178 students.		n/s	University onsite	Ulster UK	18 – 48 years	Nursing students	<ul style="list-style-type: none"> <li>• Using friends to access webct</li> <li>• Insufficient IT skills and training</li> <li>• Financial costs to students</li> <li>• Accessed website from home and university</li> <li>• Half students entered website once every 2 weeks</li> <li>• Quarter every week and a quarter twice a week</li> <li>• Themes from qualitative statements were: no control, enhanced experience, organisation of website material by lecturers</li> <li>• Access to internet problems</li> <li>• 98% of students suggested using the strategy again</li> <li>• Created a new inequality whilst being originally</li> </ul>



## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

											being designed to facilitate greater equality
Griffin, Mitchell and Thompson	2009	Using podcasting plus power point in synchrony versus delivery and of power point and podcast as separate files.	Experimental design, students assigned to one of the two groups. Plus attitudinal survey of preferences of students	Mixed Science and social science degree programmes	90 participants	69% female 31% male	University onsite	Kent UK	n/s n/s	Undergrads (full time)	<ul style="list-style-type: none"> <li>• Synchronised audio and video media are more effective than separate files. Overall test scores better</li> <li>• May suggest cognitive overload when presented separately</li> <li>• Two separate topics used for the two groups, the second (two files) students suggested may be harder topic</li> <li>• Students reported a preference for the traditional lecture format, but 40% of students had no experience of e learning methods</li> </ul>
Dey Burn and Gerdes	2009	Aimed to explore the link between learning outcomes with the use of technology Used Mayers 7 design principles. Different lecture formats about how to use and manipulate equations and the effectiveness of them	Experimental design, students into groups: Control group attended live lecture Group 2 – online lecture with image of lecturer Group 3 sound of lecturers voice plus slide presentation Retention of and knowledge transfer questions Perception of the presentations questions Focus groups for student experience	Undergrads studying Physics as an additional subject	195 students Plus small focus groups n=8	n/s	University onsite	Michigan USA		undergrad	<ul style="list-style-type: none"> <li>• No significant difference between personalised and neutral video groups on either retention or transfer groups. Suggests that split attention did not occur</li> <li>• 10% of participants in personalised group felt that the image was distracting</li> <li>• Neutral group thought they would have learned more if they could see the lecturer as well</li> <li>• Personalised video group luke warm about effect of seeing lecturer</li> <li>• Live groups scored</li> </ul>

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

											<p>significantly lower than neutral group and personalised group on transfer questions, but no difference on retention question</p> <ul style="list-style-type: none"> <li>Suggested that students in PV group and live group concentrated more on what lecturer was saying and less on the info. On slides</li> </ul>
Farah and Maybury	2009	<p>Dental students learning pathology course</p> <p>Normally lectures plus time using light microscope</p> <p>Change driven by financial restrictions</p> <p>Fewer expert staff to teach the practical sessions</p> <p>Globalisation /massification of HE</p>	<p>5 point likert survey students asked to evaluate own learning outcomes, to assess use of virtual vs light microscopes</p> <p>Group split into two and used light microscope first or virtual microscope first then switch</p>	60 students on a Systemic pathology course	57 completed the forms	n/s	University onsite	Queensland Australia	n/s 3 <sup>rd</sup> year dental students	<ul style="list-style-type: none"> <li>75% of students preferred using the virtual microscope</li> <li>Marks for quiz at the end of the activity showed no difference</li> <li>Students liked the flexibility to access the slides at home</li> <li>Seemed to positively alter how they learned and interacted with the course material, did not affect 'what' they learned</li> <li>Virtual environment also included multiple representations and included texts images and sounds</li> </ul>	
Ferenchick, Fetters and Carse	2008	<p>Early stage medical students engaging with clinical experience in geographically remote communities. Given PDA's with software</p>	<p>Aimed to measure point of care evaluation of student competence. Used logged data</p> <p>Curriculum hits</p> <p>Satisfaction survey</p>	third year medical students	Approx 95 +	n/s	Distance competence component of university based programme	Michigan USA	3 <sup>rd</sup> year medical students	<ul style="list-style-type: none"> <li>Access to the information on PDA increased if activity was linked to a formal assignment, 54% of all hits were to 2 conditions assessed during a formative activity</li> <li>Most popular categories</li> </ul>	

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

		to translate: Objectives Explanations Resources eg images and sound files Interactive test questions Into effective patient care								<p>accessed were knowledge based not competence based, students were not observed directly examining students so not external reason to access the skill based competencies</p> <ul style="list-style-type: none"> <li>• Some problems not accessed at all, these were linked to problems of a lack of reinforcement and discussion in the teaching environment</li> <li>• Use of PDA's with embedded curriculum were found to be useful by a minority of students – thought that if linked to assessment this would increase.</li> </ul>
Nagy Shadman and Desrochers	2008	Effect of Student Response system on Science phobic students(future trainee teachers) on earth and physical science courses	Student perception survey designed to elicit opinions, likert scale strongly agree to strongly disagree	Liberal studies students also having to learn science and maths as wish to become teachers in the future	350	n/s	USA	n/s	undergrad	<ul style="list-style-type: none"> <li>• Encourages attendance to class in a small percentage &lt; 20%, and stops some, 30% from being late</li> <li>• System helped the majority of the students to learn, less than 50% reported improved problem solving skills</li> <li>• Enhances internal monitoring and paying attention – less than 40% felt that it inhibited day dreaming during lectures</li> <li>• Increased participation and inclass student – student interaction for the majority of students</li> <li>• Helped 25 – 50% of</li> </ul>

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

										<p>students feel more connected to the instructor</p> <ul style="list-style-type: none"> <li>Majority of students felt very positive about engagement, that is receiving prompt instructor feedback and how hard they worked to meet instructors expectations</li> <li>Overall more than 2/3 of students enjoyed and recommended using SRT system in future courses</li> <li>Immediate feedback was the most significant find</li> <li>MCQ's offer excellent opportunity for post test discussion</li> <li>Lecturers gain from feedback also and can improve learning by adapting lesson /lecturer</li> </ul>
Mcvay, Murphy, Yoon,	2007	Study for evaluating the way in which technology can influence the educational process in particularly for the core competences for entry into accounting profession Effect of classroom configuration and IT (whiteboard and laptops in every room)	Student self reporting survey Uses Chickering and Gamson (7 principles of good practice in undergrad education	Students enrolled on accounting courses	73 students		USA		undergrad	<p>Students reported that</p> <ul style="list-style-type: none"> <li>Classroom configuration and technology leveraged some of the 7 principles and enhanced certain core competences communication skills, decision making skills, and ways of learning</li> <li>2 principles most likely to be leveraged were cooperation among students and respect for diverse talents and ways of learning</li> <li>Difficult to ascertain</li> </ul>

## Lecturer experience of enhancing teaching with technology synthesis grid, L. Jump

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										whether they work alone or are the result of several improvements working together
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