

**CONNECTING TECHNOLOGY AND UNIVERSITY TEACHING:
A PILOT STUDY**

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‘Only connect! That was the whole of her sermon.’ – E.M. Forster

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Abstract

This dissertation acts as a pilot study to explore a methodology and provide context for researching ICTs (Information Communications Technologies) and Higher Education (HE). The overall study has been designed in response to an increasing rejection of technologically deterministic approaches to researching ICTs in HE, and the call for more in-depth, grounded research of what university teachers are doing with technology and why. This dissertation explores the relationships between university teachers' experiences and perceptions of teaching, learning, and ICTs in order to foster a deeper connection between the learning technologies community and the academic communities that it seeks to inform. This exploration adopts a case-study strategy and is based on in-depth interviews conducted with ten university teachers' at the University of Oxford. First level coding and categorical aggregation were used as a means of analysing the data, teasing out patterns that emerged across the interviews. Individual teacher vignettes were also used to place experiences and perceptions within context.

The case-study provides a rather different picture to that painted by the dominant discourses about ICTs and HE. Experiences and perceptions of ICTs are multi-dimensional, influenced a great deal by experiences and perceptions of teaching and learning. In particular, in this study the Oxford pedagogy played a very strong role in shaping interviewees' perceptions of ICTs and their place within teaching and learning. Findings included the identification of four principle themes relating technology to university teaching; interaction; information and knowledge; dependency; and professional identity. These four patterns illuminated why some teachers chose to adopt certain technologies in their teaching, whilst others did not. Along with these themes motivations for the adoption, and non adoption, of ICTs were constituted. The study identifies a number of methodological strengths and weaknesses, proposing finally a mixed methods approach for future exploration. In summary the research highlighted a mesh of interrelating factors that are at work when using ICTs in teaching and learning, and the importance of considering the full range of experiences and perceptions when embarking on ICT ventures. This study thus provides a strong foundation for further scholarship in ICTs and HE.

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Chapter 1 Introduction

1.1 Context of the study

This dissertation acts as a pilot study with the purpose of exploring and developing a methodological framework to be used in my proposed doctoral research. The objective of the doctoral study is to investigate the perceptions and experiences that university teachers at Oxford University have of teaching, learning and technology. It is intended to contribute to the growing body of knowledge on the use of Information Communication Technologies (ICTs) in Higher Education (HE) by providing an analysis and understanding of the complex processes involved in teaching and learning with technology and using this assess how technology can be best used to support these. The aim is thus to build a *connection* between teaching and technology.

As well as working towards a methodological framework for my doctoral research, this study begins to explore the different roles technology plays within the teaching and learning processes at the University of Oxford, to find out what is ‘really’ happening – what teachers do and why. In this sense the study will provide important contextual information for the proposed doctoral study.

1.2 A personal context

At face value the history of e-learning at Oxford has been successful. However, beneath the surface the reason for its success is largely dependent upon various e-learning enthusiasts and groups within the university. Working within the Learning Technologies Group (LTG) I have seen resources and time become invested in large-scale projects that which, while making an impact, still fail to draw the commitment from academic staff which is needed to fulfil the visions that triggered the projects’ inception. Some projects simply fall by the wayside. E-learning projects are largely

technology-led and reactive to current ‘buzz’ technologies and we do not have the time, the resources, or the skills to find out specifically how our institution can really benefit from technology, what it really needs and what is likely to be successful. We presume it will be the same as other universities, that we can follow successful innovations elsewhere and make them successful at home. However, each institution has its own character and culture that will affect this. I wanted to begin to understand why certain projects were more successful than others, to understand how we could reach more than the handful of enthusiasts that we repetitively deal with, paint a picture of what academics are really doing with ICTs. I wanted to know how I could make the LTG’s work more relevant and aligned with the environment in which it operates. This study therefore primarily grows from my own personal involvement of the field in which I work.

1.3 Structure of the study

Chapter 2 opens with a discussion of the wider issues relating to the use of ICTs within HE institutions and reviews the mounting body of literature within this field. Literature that discusses the institutional and individual experiences of teaching, learning, and technology is identified as providing the foundations for this study. This chapter also looks at the history of e-learning at the University of Oxford to place the study within context. From this overview weaknesses and gaps within the existing body of literature are identified and the chapter will end with a formulation of the key research questions.

Chapter 3 presents a methodological discussion of the case study strategy that was used to explore these phenomena and the interviewing technique used to obtain data. The specific procedures, ethical considerations and the process of data analysis

involved in interpreting the information gathered are also addressed in this chapter.

The results of the interviews will be outlined in Chapter 4, and finally reflections on the study and suggestions for a methodological framework to be used in the doctoral study are made in Chapter 5.

Chapter 2 ICTs in Higher Education: perspectives from the literature

The background for this research relates to two broad contexts: firstly, the context of external pressures for change involving ICTs in HE, and secondly, the context for research into teaching and learning in HE. These, along with an overview of the history of e-learning at Oxford University will also be addressed in this chapter.

2.1 The global context

Government rhetoric on ICTs in HE has characterised the introduction of ICTS to HE as a process that is at once desirable and unstoppable, woven together with the concept of the inevitable progression of globalisation. In 2000 David Blunkett, then British Minister for State of Education, in his ‘Greenwich Speech’ told his audience that ‘learning has become big business’, competitors to UK providers are ‘marketing themselves aggressively’, and the role of new technologies in learning is so ‘well rehearsed’ that it is ‘clear that virtual learning is an industry which is striding all around us’. The notion that ‘everybody else’s doing it’ (Jenkins et al., 2001) has become a key factor in ‘technifying the campus’ (Engeldinger, 1998). For some authors the business of ‘borderless’ HE (CVCP/HEFCE, 2000) is threatening traditional institutions. Global mega-universities like the University of Phoenix (USA) and the Open University (UK) hold strong global market positions by being able to offer entire degree curricula via technology. To retain their competitive edge UK HE institutions have to play harder within the international marketplace and deliver more flexible, accessible, and richer learning experiences that are better value for money (Lee, 1999).

In response to the pressures of globalisation the face of HE is changing. Student numbers continue to rise and the types of students entering university are becoming more diversified. The student body no longer has fixed patterns of engagement with their university, often juggling study, employment and family commitments, which leads to a growing emphasis on postgraduate education, lifelong learning and

continuing education. In parallel, staff time is becoming increasingly compromised with the rise in student numbers, the introduction of the Quality Assurance Agency (QAA) and Research Assessment Exercise (RAE), and the pressure to become more entrepreneurial and attract external funding. However, in many cases, reduced access to government funding has meant reduced resources and the need to do much more with much less. Additionally, there is an increasing demand within HE for educators to provide a type of learning that is of a 'more experimental and individual kind' (Salmon, 2002). Ideally, learning should be personalised and customised to each learner, in order to extend learning opportunities and accommodate different paces and styles of learning (Milband, 2004). Alongside this collaborative learning is being viewed as more and more important in providing the cognitive and social skills needed for communication and preparing students for their roles in the changing labour market. This perfectly mirrors Blunkett's vision for the future of HE:

[H]igher education in this century will need to look very different to the system which evolved in the second half of the twentieth. It will typically be mixed mode - delivering through ICT and other learning at a distance, as well as face-to-face. It will offer flexible provision tailored to need, overcoming traditional distinctions between full and part-time study, and responding rapidly to changing social and economic conditions. Its students will reflect the society of which it is a part, drawn from all backgrounds, and they will undertake learning at home or in the workplace, as well as at the campus. Learning programmes will be more diverse and offered within a flexible credit and qualifications framework which embraces intensive short courses and recurrent lifetime participation. (Blunkett, 2000)

ICT is perceived by its enthusiasts as both a driver and a consequence of change in HE. Other authors, however, remain more sanguine about its impact. Away from the utopian rhetoric there is an emerging body of research critiquing the hype and 'cyberbole' of educational technology. The recent CHEP Report (Collins and Van der Wende, 2002) investigated current and future uses of ICTs in HE and came to three conclusions. Firstly, institutions do not expect a revolutionary change as a result from or related to the use of ICT. Change is a slow and gradual process largely arising as a result of slight variations in needs and demands by institutions. Secondly, ICT use in terms of e-mail, word-processing, PowerPoint, and the Web, has become standard as part of teaching and learning processes. However, this has not radically affected the nature of the teaching itself; rather, ICT has become part of the 'blend' of on-campus

delivery. Lastly, in terms of teaching and learning practices, university teachers are still apprehensive about the use of ICT. They are less concerned with, interested in, or hopeful about technology than those not on the 'front line' (the decision makers and support staff). Thus uptake of more 'innovative' practice is still in its infancy. What ICTs have done has been rather 'mundane', substituting and supplementing existing practices rather than transforming them, making processes more visible and concrete rather than more 'virtual' (Robbins et al., 1999). The references to 'being left behind' and the pressure to compete have created a feeling of anxiety. This has resulted in organisations taking risks and looking for quick 'technofixes' that have led to some spectacular failures: for instance the UK e-University and the Oxford, Yale and Stanford 'AllLearn' project. The introduction of Virtual Learning Environments (VLEs) and Managed Learning Environments (MLEs) in many HE institutions aimed to utilize the potential of ICTs to bring about institution-wide improvements to teaching and learning; however, there is little evidence to underpin the high expectations of their marketing.

A number of authors point to the lack of specific e-learning strategies as a major barrier for the wider uptake of ICT in teaching and learning (Jenkins et al., 2001, Stiles, 2002, Lisewski, 2004, Sharpe et al., 2006). Likewise, Timmins notes that even when ICT is moved more centrally into teaching and learning or institutional academic strategies it still remains 'marginal in terms of practices and cultural values of most academic departments', represented by 'pockets of activity and innovation' and where senior managers refer to 'the enthusiasts' as a 'small but precious minority' (Timmins, 2003). As a result the literature on ICTs and HE is increasingly moving away from the globalised landscape towards a more localized, individual context of teaching and learning. If we are to understand the impact of technology on pedagogy we need to take account of these local conditions and the range of responses to particular pressures, rather than rely on overly deterministic accounts of global tendencies. (Clegg et al., 2003).

2.2 The teaching and learning context

The theme of teaching and learning is one of the most theorized areas of research and writing on HE, with the emphasis on how students and their teachers conceive of learning and how students approach learning. It is clear that academics and students

hold very different, and often conflicting, views of learning (Marton et al., 1993, Prosser et al., 1994, Tynjala, 1997). These may develop over time (Devlin, 2002, McKenzie, 2003) and may be related to academic achievement (McLean, 2001). Approaches to learning are not based on characteristics or personality traits; rather, they are relations between students, their prior experiences and how they perceive their learning situations. Thus, teachers can influence these approaches by changing the learning contexts which students perceive (Prosser and Trigwell, 1999, McKenzie, 2003). Additionally, it is an increasing trend that university teachers are increasingly becoming ‘facilitators of learning’, providing frameworks and support for their students rather than teaching via a more conventional method that takes control of the learning situation (Brockbank and McGill, 1998).

How technology affects these processes and vice versa has become a recurring question in the body of literature on teaching and learning in HE. It is possible to chart a long series of developments since the invention of the microcomputer that has kept this question in focus: computer-based training, multimedia, the world wide web. The pages of Journals like *ALT-J* and the *British Journal of Educational Technology* are littered with individual case studies of innovations using these tools and attempting to explore this question. In response Underwood comments that:

[T]oo many of the articles...focus on the technology rather than the impacts of the technology on human endeavour...What is needed here is a shift of focus which allows that the technology should always be of secondary importance. If it is of primary importance, then it could be argued the research should sit in computer science rather than education. (2004: 140)

Whilst it is important to research and document innovative practice and new technologies, this is largely a study of the ‘precious minority’ that Timmins discusses. Such research is largely conducted in order to justify the use of technology to key stake holders such as administrators, funding bodies and departmental heads. As a result, such research largely asks ‘technocentric’ questions (Papert, 1993), and we are still trying to understand the sustained relationship between technology and learning in the wider university environment (Oliver, 2006).

What has become clear is that we need to recognise the complexity of teaching and learning processes before we can provide answers to the question of how technology

can be used to support them (Clegg et al., 2003, Oliver, 2006, Brown and Duguid, 2000). Pedagogic frameworks for the use of learning technologies are still only just emerging. Laurillard offers what she terms a 'conversational framework' for the effective use of learning technologies, which she applies to an analysis of teaching and learning as a whole (Laurillard, 2001). She argues that the effective use of learning technologies can only be achieved if we understand the character and complexity of academic learning, the roles of students and teachers in the learning process, and the strengths and weaknesses of various technological media as support mechanisms for those roles. Hanson identifies the importance of a number of factors for implementing ICTs (senior management support, top-down budget allocation, centralised technical and pedagogical support, staff development opportunities). However, the most important factor for success is 'winning the hearts and minds of lecturers', who will have to change their perceptions of, and approaches to, teaching in order to participate in this shift in direction (Hanson, 2003). This has strong links with the literature on teachers' self-efficacy and personal theories of learning and teaching (Ertmer et al., 2001, Errington, 2004, Churchill, 2006), which discusses the importance in fostering teachers' beliefs and visions of their capacity to work with technology to shape appropriate use. In order for their hearts and minds to be won, the lecturers need to arrive at the decision that their practice can be transformed for the better through technology, and this of course is not always the case. What Hanson and other authors seem to overlook is that technical innovation has to start with a deep understanding of the variety of experiences and perceptions of teachers in order to identify how and where technology can support, build upon and transform existing practice. Oliver argues that the challenge we face as researchers within this field is not to continue the trend to research and evaluate the effectiveness of various technological innovations, but rather to understand the everyday environments in which university teachers move and where technology sits within those environments:

[T]his more complicated picture requires a more conservative approach: finding out what teachers do and why, then working out how technology can be best used to support that. This is not to deny the importance of developing innovative teaching techniques . . . However, it is to call into question its relevance to the vast majority of teachers in higher education. If innovative research is all we do we run the risk of not connecting, of producing nothing that is relevant and meaningful to their daily practices. It would be particularly ironic for our research to end up being unread because we could not establish a connection. (2006: 4)

What Oliver is suggesting is an engagement by practitioners and researchers with both the fields of learning and teaching and ICT, closing the gap that so often exists between the technology and the practice. Perhaps a criticism of Oliver is that he too easily infers a contentment with the ‘comfort zone’ (Nomdo, 2004). He implies that ICTs should be used to support existing practice, rather than to transform teaching and learning in order to move academic practice forward and explore new possibilities offered by educational technology. What stands, though, is that a deep understanding of teaching and ICTs at the level of individual practitioners is needed to build a stable and productive connection between the learning technology community and the academic communities that it seeks to inform. As McDougall and Jones state, ‘investigation in this area should focus more on contributing to knowledge about learning and teaching, and less on seemingly widespread concern for demonstrating benefits of ICTs in education to justify its cost’ (McDougall and Jones, 2006).

2.3 The institutional context: a history of e-learning at the University of Oxford

Oxford University has a lengthy and active history of participation in e-learning, both in the development of educational technologies and in the hosting of local and national projects focusing on teaching with ICT. E-learning initiatives predominantly started in the mid 1970s when ‘the University realized that it needed to do more to promote the use of computers in the humanities’ (Tosca, 2000). In response, a highly successful concordance programme was initiated which eventually led to Oxford University Computing Services (OUCS) becoming the national co-ordinating body for the Computers in Teaching Initiative (CTI). Running between 1989 and 2000 this initiative consisted of a number of subject-specific centres based at universities around the country which advised academics on the electronic resources available to them and how to integrate these within their teaching¹, one of which, the Centre for Textual Studies, was based at Oxford.

¹ In 2000 the CTI was replaced with the Learning and Teaching Support Network (LTSN) which was not based in Oxford.

Oxford's growing specialisation in humanities computing led to a number of other programmes being based within OUCS including the Oxford Text Archive (OTA), which since the mid 1970s has been providing electronic texts for Arts and Humanities teachers, and the Humbul Humanities Hub (1991), which provides a large gateway of catalogued and reviewed online resources. In 1988 the Centre for Humanities Computing (CHC) was established to provide a base for Humanities lecturers to come and use computers, and to provide computer training to staff and graduate students within the division. In 1995 the Humanities Computing Unit was set up to rationalize all the different humanities computing sections within OUCS and run them as a service to the University.

During this time a number of nationally funded projects were initiated. Between 1992 and 1994 the Information Technology Training Initiative was commissioned to develop two applications for teaching literature; *The Poetry Shell*, which allowed academics to create hypertext editions of texts, and a hypertext edition of the Anglo-Saxon poem *The Dream of the Rood* (an applied version of *The Poetry Shell*). In 1996 OUCS successfully won funding under the Joint Information Systems Committee (JISC) Technology Applications Programmes (JTAP) to develop software that worked with large multimedia archives to create on-line tutorials. This was put into practice using large amounts of digitised media from the First World War to create the award-winning Virtual Seminars project.² In 1998 Project ASTER was started to look at the effectiveness of ICT in small-group teaching across a variety of disciplines, producing a range of case studies and an extensive bibliography as its output. Following a survey of academics within the humanities at Oxford, the Humanities Computing Development Team (HCDT) was set up in 1996 to work collaboratively with academics, both individually and in groups, to develop technology-based teaching and research resources.

Before long, though, the university called for the expertise in e-learning based within OUCS to become available to all the university disciplines, not just the Arts and Humanities. Eventually, in 2001, the HCU was disbanded and a new group was formed named the Learning Technologies Group (LTG) whose specific aim was to

² <http://www.oucs.ox.ac.uk/ltg/projects/jtap/>

‘support all divisions within the University of Oxford in the development and innovative use of IT in teaching and research’ (LTG Website³). In parallel with this the HCDDT expanded its remit to work with all five academic divisions of the university and was renamed the Academic Computing Development Team (ACDDT). In the five years that it has run the LTG has been at the foreground of a number of initiatives. In 2001 it implemented the university-wide VLE system, WebLearn; there has been a huge expansion in training courses and workshops offered to all university staff and students; a high turn-over of custom-made ICT tools to support academic practice; and the introduction of high-quality, showcase, ICT lecture rooms at OUCS which are available for staff to use. The LTG continues to bid successfully for external funding from bodies such as the JISC and the Higher Education Academy (HEA) and has seen its staff numbers rise significantly. Additionally, in 2005, the LTG collaborated with the Department of Educational Studies to establish an MSc course programme in E-learning.

2.4 Rationale and research questions

From the preliminary review of the literature in this area I can draw the following points. Firstly, within research on ICT in HE there is still an overemphasis on technical rational. This is largely due to the need to justify the expense and difficulties associated with using ICTs required by administrators and funding bodies responding to the need to remain competitive within the HE global marketplace. This type of research largely pre-empts its own findings and is not necessarily justified. Secondly, there is an under-emphasis on the relationship between individuals and the use of ICTs in teaching at university level. There is a need to understand what is really happening on the ‘ground level’ and explore teachers’ perceptions and experiences of their teaching, their students’ learning and of ICT in order to foster a deeper connection between technology and education. As preparatory work for my doctoral study, I wish to gain a deeper insight into how best to explore these perceptions and experiences. As I am interested in what teachers personally perceive and experience, I will be exploring the use of the interview technique to encourage both the discussion

³ <http://www.oucs.ox.ac.uk/ltg/>

of fact and the articulation of understandings. My research questions cover three areas:

1. Are lecturers using ICTs within their teaching at Oxford University? If so, what sort of ICTs and how?
2. Do lecturers' perceptions of teaching and learning influence their use of ICTs?
3. What are the motivations to adopt or not to adopt ICTs in teaching?

Chapter 3 Methodologies for researching perceptions of ICTs and teaching

In a recent article on developing methodologies for researching ICTs in education, McDougall and Jones write that ‘quality research in this area cannot be done with “quick and dirty” methodologies; it requires harder work and more sophisticated data collection and analysis techniques to deal with the high levels of complexity of the processes we are investigating’ (2006: 357). This chapter describes the research approaches that I have taken to investigate these processes and why they are useful for looking at perceptions of ICTs and teaching in HE. As described in the previous chapter, there has been a noticeable gap in the research on ICTs in HE at the level of the teacher. Previous research has predominantly adopted a case-study approach using technologies, institutional strategies, and when at the level of the individual, innovators, as the case of study. This enquiry also draws upon a case study methodology; however, in contrast to its predecessors it aims to include multiple components of variation in its exploration. I will begin this chapter with an overview of the case study as an approach to the research, the criticisms connected to this approach and ways of addressing them. I will then move on to a more specific discussion of the techniques that I used when conducting this study.

3.1 Reasons for choosing a case study research strategy

The goals of this study are both illustrative and exploratory. They are illustrative in the sense of making the unfamiliar familiar and to provide contextual information for future research. They are exploratory in the sense of beginning a process of generating theories and hypotheses about the phenomena being researched. The research questions posed do not demand answers either to support or falsify a hypothesis; rather, they seek to understand and describe a particular group of people and their perceptions. A qualitative approach is thus the most appropriate strategy to explore these questions effectively. As Miles and Huberman note: qualitative data ‘with their emphasis on people’s “lived experience,” are fundamentally well suited locating the *meanings* people place on the events, processes, and structures of their lives: their “perceptions, assumptions, prejudgements, presuppositions” (van Manen, 1977) and for connecting these means to the *social world* around them” (1994: 10).

Being qualitative in nature, this research also uses an inductive approach, in that it allows concepts and theories to emerge from the data collected rather than starting with a body of prior theory as a framework to support or falsify a particular hypothesis (a deductive model). This is aligned to the ‘grounded theory’ tradition proposed by (Glaser and Strauss, 1967). From the data I want to start to capture a model of some aspect of reality that I hope will be found in accordance with ‘the facts’ about that reality in this one context, so that others will find this model of use when looking at their own environment.

The ‘research strategy’ is the logic by which the study intends to proceed in order to answer its research questions (Punch, 1998). In this instance a case-study strategy was used. A case-study strategy ‘involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence’ (Yin 1994). A case is studied in its own right within a specified ‘setting’; as Miles and Huberman note, ‘we cannot study individual cases devoid of their context in a way that a quantitative researcher often does’ (1994: 27). The case itself can be virtually anything: an individual person, a group, an institution, an innovation, a service, and so on. In this instance the case is defined as a group of individuals within one HE institution. The group is a selection of university teachers, and the institution, the University of Oxford. In this sense the case has multiple components, supplying multiple sources of evidence to tell a story about that group.

3.1.1 The in-depth interview as the method of data collection

Stake (1995), and Yin (1994) identified at least six sources of evidence in case-study research: documents; archival records; interviews; direct observation; participant-observation; and physical artefacts. Due to the exploratory nature of the research questions and the time limits on this study I chose only one method to pilot: the in-depth interview. Oppenheim considers the purpose of the exploratory interview as ‘essentially heuristic: to develop ideas and research hypotheses rather than to gather facts and statistics’ (Oppenheim, 1996). An interview method was deemed appropriate at this stage because I was interested in the university teachers’ own reports of their experiences of teaching, learning and technology, rather than my observations on their behaviours as a researcher. Interviews allowed me to learn about

what cannot be seen in an observational setting, why university teachers teach the way they do and why they may, or may not, use ICTs to help them.

3.2 Issues in case study research: data, interpretations and outcomes

There has been considerable debate concerning the validity of case-study research. Likewise, the use of interviews as the sole means of data collection naturally raises questions of reliability, validity and generalisation. In educational research reliability usually refers to the consistency and replicability of findings; validity to whether the data accurately represents the features of the phenomena studied; and generalisation to whether the findings can be transferred to another population.

The goal of qualitative research is to discover meaning and understanding, rather than to verify truth or predict outcomes. The concepts above stem from positivist, objective views of knowledge that are abstract to the notion of empirical inquiry. However, rather than dismiss qualitative research as unconcerned with these matters, I would like to address two of the major misconceptions that are attached to this study: firstly, that case study research is not generalisable; and secondly, that the interview, as a sole means of data collection, is not valid.

3.2.1 The generalisation of case-study research

It is debateable whether generalisation should be considered at all within case-study research. Essentially generalisation is a problem of positivism and to discuss it in relation to this method of inquiry is inimical. However, by the mere act of publication case study researchers proclaim that their work is of relevance to others. I too am engaging in this act of research in the hope that my work will be of use elsewhere. Thus, a discussion of generalisation is needed to justify this method.

To question a generalisation is to examine the justification for making inferences; thus, generalization is clearly related to validity. To argue that one's analysis of a case is valid is to claim that that analysis is transferable to other instances (Ruddin, 2006). Commentators of case-study research have often claimed that one cannot generalise on the basis of one case, that one case can not provide trustworthy information about a wider class. This standpoint has been viewed as a common misconception that confuses case inference with statistical inference. A case analysis is not about

inferring statistics; rather, it is about pattern-matching 'onto' a case, and a strong form of hypothetico-deductive theorizing (Ruddin, 2006, Mitchell, 2000, Flyvbjerg, 2006) Cases generate concrete, practical, and context-dependent knowledge, and in this respect formal generalisations are considerably glorified as a key factor in research.

Trying to choose a 'representative' case from which to generalise has been considered as a way to improve the strength of transferability. This, Yin (1994) states critically, will not address the complaints of ungeneralisability. Similarly, (Stake, 1995) states that 'case study research is not sampling research...we do not study a case primarily to understand other cases. Our first obligation is to understand this one case' (1995: 4). When the objective is to capture the greatest possible amount of information with which to explore a phenomenon in depth, as is the objective of this study, the 'typical' case is unlikely to hold the richest information (Flyvbjerg, 2006). When discussing strategies for case selection Flyvbjerg argues:

[F]rom both an understanding-oriented and an action-oriented perspective, it is often more important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur. Random samples emphasizing representativeness will seldom be able to produce this kind of insight; it is more appropriate to select some few cases chosen for their validity. (2006: 11)

The author then moves on to propose that the researcher should purposefully select 'extreme' or 'critical' cases, or a number of cases that exhibit 'maximum variation' in order to be able to describe the phenomena in greater depth (Flyvbjerg, 2006: 230). Likewise, Stake recommends that the first criterion of selection should be to maximize what can be learned – 'what cases are likely to lead us to understandings, to assertions, perhaps even to modifying our generalizations'. Sometimes, he says, a 'typical' case works well but often an 'unusual' case helps to illustrate matters that we fail to see in typical cases (1995: 4).

Stake goes on to argue that case studies need not make any claims about the generalisability of their findings at all, that what is crucial is the use others make of them and that they feed into processes of what he terms 'naturalistic generalization' (Stake, 1982). To facilitate this process the researcher must describe the case properly in a way that captures all of its subtleties and distinctive attributes. The reader becomes the centre point of analysis; as Lincoln and Guba state:

[O]ne must consider the situation from the perspective of the user of the generalization. Case studies will often be the preferred method of research because they may be epistemologically in harmony with the reader's experience...and thus to that persona natural basis for generalization. (2000: 36)

The generalisability of case study research lies in the possibilities of being able to hypo-theorise from a case, and secondly from being able to offer the reader the resources to perform naturalistic generalisation. The aim of the data collected in this study is to generate insights and concepts, not to universalise about them. Whether a piece of research is generalisable is not a binary decision; rather, it should be measured as a degree of strength. The generalisability of case study research can be strengthened through appropriate steps taken by the researcher to provide the 'thick description' needed to reach conclusions as its transferability.

3.2.2 Questions of reliability and validity in interview studies

In terms of validity, there has recently been a body of criticism focusing on the 'over-dependency' among qualitative researchers on interview data (Hammersley, 2003). The accuracy of data representation within an interview has been questioned for many reasons. The interviewee may distort information through recall error, selective perceptions, or a desire to please interviewer. On the other hand, the interviewer, may influence the responses from the interviewee through their own performance, through appearing to agree or disagree with the interviewee's responses or simply through who they are (gender, age, race etc.). Interview situations are reactive to personalities, moods, and interpersonal dynamics between the interviewer and the interviewee, thus critiques argue that the 'voice', on its own, cannot be considered as an 'authentic truth', rather it is a 'methodically constructed social product that emerges from its reflexive communicative practices' (Gubrium & Holstein, 2002: 11 quoted in Hammersley, 2003: 119). The reality is that every day we receive accounts that contain a mixture of the real and the representative, and as a researcher there is no reason that the accounts I receive through an interview should be unlike these: 'the fact that people have background assumptions, preferences, interests, etc. does not automatically mean that their accounts are biased or simply expressions of these things' (Hammersley 2003: 124).

During analysis interview data is problematic. Proponents of interview validity argue that, for data to be applicable, it must be reproducible. However, the ability to reproduce the findings reliably from an interview situation is inconsistent with the dynamic notion of awareness: that an interview seeks to elicit data about a particular phenomenon at a specific point in time. Some researchers have advocated that more than one researcher should analyse the data and that through inter-researcher reliability, the bias of subjective response is lessened and data can be judged as more reliable. Other researchers propose that the analysis must maintain a level of critical awareness of how one's subjectivity influences data interpretation. This can be aided through describing experience rather than explaining it; focusing on the what and how of individual experience; and treating all individual accounts as equally important (Sandberg, 1997).

Since we maintain our humanity throughout the research process, it is largely impossible to escape the subjective experience found within an interview situation. To regulate the experience is unnatural when exploring peoples' perceptions, and to consider carefully each variable that may have an effect upon the interview will make the practicalities of conducting it overly problematic. However, by being aware of the issues that may influence the data the researcher can take measures to address those that are of major significance will strengthen the validity of the interview as a sole research method. We need to be cautious of interview data, but by no means abandon it. We must carefully consider what interview data can provide, and what they cannot provide, and from this identify what other sources of data might be needed to explore the findings in more depth.

3.3 Approaches to this study

3.3.1 Selection of university teachers to participate in the study

In this instance the focus is on a group of individual persons within a setting of university teaching. I used a method of 'extreme cases' as suggested by Flyvbjerg (2006: 230) to purposively select an initial five university teachers, through contacts at OUCS, who were known to have been involved in ICT teaching and learning projects within the university. With the help of these people I then identified a further

five university teachers who had not been involved in ICT projects and were willing to be interviewed. This would increase the ‘maximum variation’ within the case and allow me to explore it in greater depth (Flyvbjerg, 2006: 230; Stake 1995: 4).

As already stated, the ‘maximum variation’ primarily addressed variation in the use of ICTs; however, this also referred to the variation in subject area and age as table 1 shows:

Table 1: Summary of Individual Cases⁴			
Code	Age range	Discipline	ICT Project
David	50-65	Philosophy	Yes
Phillip	50-65	Modern History	No
Margaret	50-65	Modern Languages	No
June	50-65	Religious Studies	No
Peter	35-50	Physiology	Yes
Stuart	35-50	Chemistry	Yes
Chris	35-50	Business Studies	Yes
Karen	35-50	Medical Sciences	No
Rosa	25-35	Modern Languages	Yes
Alice	25-35	Geography	No

The method of purposive and snowball sampling used is commonly considered the most unreliable form of selection in terms of being able to generalize the research findings to a wider population. However, as discussed previously, concepts of sampling and generalisability do not match the goals of this study which were to examine a situation in depth from various perspectives and contribute valuable knowledge to the field, to look for variances in findings and patterns in data, and to discover meaning and understanding, rather than to verify truth or predict outcomes.

3.3.2 Development of the interview schedule and pilot interview

Initially, when I was developing the interview schedule, the nature of the interview questions focused primarily on the different uses of ICT within the working practices of the university teacher. Each interview covered all areas of academic practice: administration, teaching, and research so as to get a full picture of ICT use. The schedule consisted of five questions with some sub-questions and suggested prompts.

⁴ The names of all participants are pseudonyms in a bid to retain anonymity.

To refine and develop the interview schedule I carried out a pilot interview. This took place with one of the individuals within the case group, rather than a friend or colleague as is commonly used, as I wanted to see how someone within the case would react to the questions. I emerged from the interview feeling that I had not been able to collect enough data to explore the relationship between perceptions of teaching and ICTs in enough depth. Responses had largely addressed the subject of technology rather than its place within the teaching environment. The teacher interviewed was an enthusiast of ICT - 'I am addicted to IT, I want to use it for everything'. This concerned me from a methodological standpoint as the non-ICT proponents selected for interview would not be able to offer as many perceptions or experiences. In other words, the interview schedule was technically-led and so did not allow me to drill down to the perceptions of teaching and learning that I wanted to capture in this study.

For guidance, I looked towards other research in the field of teaching in HE (Prosser and Trigwell, 1999, Trigwell, 1996, McKenzie, 2003, Entwistle, 1997). From this body of literature I developed a series of questions that focused more on the act of teaching (of which ICTs were a sub-section) and perceptions of teaching and learning in general. This 'focus on *learning* in ICT educational research would immediately "address the failure of the ICT educational community to make contact with the central body of educational research" ' (McDougall and Jones, 2006, Underwood, 2004). I followed Entwistle's recommendation of moving from 'actions to experience, and from concrete to abstract' (1997: 60), so that teachers could begin by describing familiar aspects of their teaching before moving on to reflect more deeply. To ease the respondents into 'question-answer' mode the interview began with the general question asking them what their work entailed at the university. Questions then focused on the subject context and purpose, before moving on to the actual practice of teaching and intentions. Questions about influences for using ICTs were used as a way to explore what factors teachers saw as important in their decisions to use technology, and potentially changing their ways of using and perceiving ICTs. More direct questions on the meaning of teaching and learning were asked near the end of the interview. A typical interview schedule can be found in Appendix 2.

The interview schedule was trialled with another teacher and was deemed to explore the phenomena much more adequately. I returned to the pilot interviewee with the additional questions and both interviews were included in the final analysis.

3.3.3 Ethical considerations

My position as a member of staff at the institution where I was conducting my research meant that I faced a number of ethical dilemmas. I had easy access to individuals that I may not have otherwise had access to if I came from outside of the institution thus I had no gate-keepers to negotiate admission. Conventional ethics governing access to the research subjects, confidentiality of information and the privacy of the research subjects could be compromised by my privileged status as an insider. To address this state of affairs I followed the British Educational Research Association's (BERA) guidelines: namely, sections 11 – 13 and 23 concerning voluntary informed consent and privacy (Association, 2004). I made the purposes of my research clear both to the participants involved and to my employers to whom I would also be disseminating the findings.

In line with university requirements I was required to submit a form to the Department of Educational Studies outlining the ethical considerations within my research. This was approved. However, as I was also conducting this research as a member of staff on behalf of a university department I also sought approval from the Central University Research Ethics Committee (CUREC). CUREC, however, claimed that the research did not need ethical approval as it was classed as an 'audit' and the data gathered did not contain 'personal data'. I beg to differ with their conclusion but I felt that I had taken appropriate steps to ensure that any ethical issues were properly addressed in the study.

3.3.4 Field Procedures

I interviewed the ten university teachers between May and July 2006. Each participant was initially contacted via e-mail, in order to gain their consent to be interviewed (see Appendix 3). In some instances participants had questions concerning the interview, and in these cases I contacted the interviewees via telephone to discuss these matters further and to put them at ease. Once an interview time had been arranged the interviewees were sent a formal letter of thanks, which also reiterated the purpose of the research and their rights in terms of confidentiality and withdrawal (see Appendix

4). The interviews themselves took place in the respondents' own departmental office or college rooms, I believe that this made the respondents feel more at ease, and therefore made it more comfortable for them to talk more openly. Interviewees were again told of the purpose of the interview and again asked if they minded the interview being recorded.

All questions were asked in the same order with each respondent. However, the nature of probing questions varied with different teachers. I used several methods to help clarify issues that the teachers were talking about, depending on the individual teacher or the responses to the question posed. These methods included seeking confirmation of the information that the teachers were giving, such as asking for examples of the descriptions given or probing for intentions. Later in the interview I returned to earlier points made to seek further explanation. In some cases where there appeared to be inconsistency in the information, given by that the teacher I often asked a question in the form of "Earlier you mentioned that . . . now you are saying that . . . can you tell me why that is?". I found it particularly useful to reflect back to the teachers their own words then ask for expansion or clarification. This said, however, most of the interviewees needed little prompting when asked about their methods of teaching and use of ICTs and their reasons, personal or contextual, why.

To help myself become familiar with the data I listened to the sound recordings of each interview immediately after the event and wrote a brief summary of each conversation. This included the main information I had obtained for each interview question and any other points that struck me as particularly salient or illuminating.

3.3.5 Transcribing the data

Transcription is not a simple process of converting speech to text (Kvale, 1996). I needed to decide who was going to do the transcriptions, and whether to include elements of the discourse such as laughing, groaning, and whether to include pauses. I did the first two transcriptions myself to help decide what elements to include and concluded that for the exploratory and contextual purposes of this research such a detailed transcription was not needed. However I decided that the transcriptions should be verbatim and should include, "ums", "ahs" etc. and unfinished sentences.

Two professional transcribers were used to transcribe the remaining eight interviews. Both were given the same instructions to translate verbatim, what to include, and to replace any words or expressions that they could not decipher should be replaced with a time bracket. The transcripts were e-mailed to me as Word files and I went through each file while listening to the audio recording to check for accuracy and decipher any words that the transcriber could not interpret. For each interview this process took about two hours, and while the primary purpose was for correction it also served as a useful way to refamiliarise myself with the data and begin to gain some impressions about what the teachers were saying. After finishing each tape I expanded the summary I had written after each interview and added additional thoughts as required.

The transcripts and the summaries were not returned to the teacher for checking and comment. Firstly, time limitations and the time of academic year, made it impractical and would have delayed the analysis procedure. Secondly, the interviews were conducted at a particular moment in time and in some cases the interviews were not transcribed for a while. It is possible that a teacher's views may have changed in this period and possibly as a result of interview.

3.3.6 Analysing the transcripts

Miles and Huberman write that 'in any study that has multiple cases, the meaning of what is happening in each case tends increasingly to get lost in the welter of fieldwork, writes-ups, coding, and other preliminary analysis' (1994: 76). With over 200 pages of transcribed interview data, analysis proved a testing activity. Much of the data reduction occurred naturally before I reached the formal stage of analysis through the construction of the research questions, the case selection, the development of the interview schedule and so forth (Miles and Huberman, 1994). I began my analysis with categorical aggregation (first-level coding) as recommended by Stake (1995) and (Miles and Huberman, 1994) to summarize segments of data for each case. At this stage my focus was on the individual teacher's experience rather than looking for common themes at a collective level. I started with a provisional list of codes which I defined prior to the analysis. These codes were directly related to the research questions, themes that emerged through the literature review and previous research, and initial readings of the interview transcripts. As I started to analyse the data I realised there was more going on than I had initially accounted for, and there was a

large degree of variation in the ways that teachers perceived ICT, learning and their teaching practices. As a result the codes were revised and progressively more were added. For a complete list of codes see Appendix 5.

As I read more transcripts I began to notice more similarities and variances in perceptions of teaching and influences and barriers in using ICTs. When looking at the transcripts I found the core questions arising with regard to each transcript, which as they formed began to clarify what seemed to be key issues. These questions were:

1. How does the teacher teach?
2. What are these acts of teaching focused towards, what is the teacher seeking to bring about by them?
3. How does the teacher use or wish to use ICTs?
4. How does the teacher perceive the role of ICTs within their teaching context?
5. What are the particular motivations for teachers to adopt ICTs in teaching and learning?
6. What are the particular motivations for teachers not to adopt ICTs in teaching and learning?

I used colour-coding to assist in identifying relevant quotes relating to these focus questions and began a process of pattern-matching (Stake 1995; Miles and Huberman 1994, Yin 1994) to group these segments into a number of themes to aid cross-case analysis. By seeing what common themes emerged from that process I began to formulate propositions that might extend to other, as yet unseen, cases, and would therefore constitute future research questions. This analysis had several outcomes. Firstly, it became evident that some of the themes that emerged differed from those outlined in previous research. In particular, there appeared to be one category that related to the specific cultural experience of teaching at Oxford and perceptions of ICT in connection with this. Secondly, it became noticeable that many of the themes that surfaced were inherent paradoxes of each other; for instance information versus knowledge, and dependent versus independent learning. Thirdly, connections between actual use of ICTs, perceptions of ICTs and perceptions of teaching and learning also began to manifest through the analysis. For an extract of coded transcript see Appendix 6.

3.3.7 *Reporting the findings*

To aid naturalistic generalization the reader must be provided with a rich, thick description of the case being studied:

Case stories written like this can neither be briefly recounted nor summarized in a few main results. The case story is itself the result. It is a “virtual reality,” so to speak. For the reader willing to enter this reality and explore it inside and out, the payback is meant to be a sensitivity to the issues at hand that cannot be obtained from theory. (Flyvbjerg, 2006: 238)

I have chosen to illuminate the findings of this research not only with relevant quotes but also with a series of teacher vignettes developed throughout the analysis procedure. These will illustrate the relations between university teachers’ perceptions of teaching and their perceptions of ICTs. I have chosen the term ‘vignette’ rather than ‘case study’ as I wish to illuminate findings rather than to provide a rich thick description of the whole of each individual’s experience – after all, the individual in this study is an element of the case study, not the whole of it.

In conveying the results of the analysis I found it useful to conceptualize the data in two different ways; firstly as types of relationship that the case had with ICTs, and secondly as inter-case themes that emerged as tensions and paradoxes concerning the place of ICT within an individual’s culture, discipline, and classroom practice at Oxford University. This discussion, by no means, covers all the discoveries made within the analysis. There were many interesting finds, and many interesting accounts from those whom I interviewed. However, data must be reduced to fit the purpose of the methodological investigation and eventually themes specifically relating to the research questions posed in Chapter 2 were teased out. What follows in Chapter 4 is a thematic discussion of this analysis.

Chapter 4 Results from the interviews

Before describing the themes which appear to connect technology and university teaching within the case group studied, I will put these into the context of individual teachers' experiences by means of three vignettes. Each vignette is composed of extracts from the interviews conducted with the teachers and my own comments. Each description focuses on the teacher's perceptions and experiences of ICT and how they perceive and experience their own teaching and their students learning. I will then draw out from these, and the other interviews, some overall themes that connect technology to university teaching, then discuss particular motivations for the adoption, and non-adoption, of ICTs.

4.1 Experiences and perceptions of ICTs and teaching: Individual teachers descriptions

4.1.1 Vignette 1: Rosa

I have chosen Rosa as a vignette as an example of a university teacher who has embraced the use of ICTs to enhance her teaching, but whose descriptions also highlight some common barriers experienced when trying to use technology. At the time of the interview Rosa had been working at Oxford University for just under two years. She has a background in language teaching and education and her primary role is to teach Turkish language and culture to undergraduate students. She delivers some lectures but most of her teaching takes the form of 'language labs' in her office where she tutors three to five students at a time. She also has one-to-one tutorials with students when their academic work involves writing essays. Rosa states that she is 'addicted' to ICT, using it extensively within her teaching. The biggest drain on her time is preparing for classes, when she started there was no Turkish Studies at the university and she had to start from scratch. She says that she does 'everything with IT' as there are very few useful books within her discipline, so she usually looks to the Internet for resources.

Rosa says that she has always had an interest in IT and enjoys learning how to use new tools, explaining that it brings out her 'creative side'. Rosa has created a great number of small electronic resources for her classes. These include PowerPoint animations, online quizzes, articles, presentations, and lists of links to online

resources. She has started to use the institutional VLE but she does not find it ‘visually or functionally optimal’ for what she wants to do and this is frustrating. It is important to Rosa that she moves her academic career forwards and she ‘dreams of making a website’ which will show off all of her resources. She expresses that she is disappointed that other people can not seem to find her materials in the VLE very easily, and she would like to share her work within her subject area outside the university and have others comment on her resources and share their own with her.

When preparing for a class, Rosa scans the Internet for relevant Turkish journal articles. She prepares comprehension questions for her students based on these articles and then prepares a lesson handout. She sends the handout to the students via e-mail prior to the class, and then uploads it to the VLE. Sometimes she records herself speaking in Turkish (from the article) and uploads that to the VLE too so her students can hear the language. Through various online bibliographic databases and Google, she also finds relevant secondary reading and puts this into the VLE as well. For aural classes she creates and uploads sound files to the VLE, and for grammar classes she uploads animated PowerPoint presentations. Rosa feels that it is important to make as many materials available to students as possible and encourages them also to look for resources and add them to the VLE.

Whilst comprehension and grammar classes largely revolve around learning ‘facts and rules’, the teaching of Turkish culture involves debate and discussion. Rosa would like her students to be able to communicate more with students in Turkey and feels that ICT will be an appropriate means to do this.

When students are required to write an essay they send it to Rosa via e-mail. In the tutorial she goes over their essay with them and they retype it. They e-mail it back to her and she adds notes and corrections to the essay. She then publishes their essays to the VLE so they can compare their essays with those of others. Rosa claims that ‘they feel so motivated because they can see them there’. Next term she wants her students to start evaluating their own and each others’ essays and would like to find an online tool to help them do this.

Rosa collects feedback every term from her students. She states that this has had a significant influence on how she teaches and how she uses ICTs in her teaching:

Some of the feedback I was getting from the students blew my mind, it really did. Areas that I thought they were having no trouble with were revealed to be problematic, and some of it you know is very important for stuff they have to do later on and it was affecting their whole learning experience. I developed some more teaching resources, some games and some animated PowerPoints to help them and it seems to have worked. This year's students found it much easier. Of course this could just be because it was different students, but personally I am convinced ICT helped them learn more effectively.

Rosa sees ICT as an 'investment' in her teaching. She is prepared to put in some time in the beginning and 'be patient' while creating presentations and animations which are 'tricky' and 'time consuming'; as each year she will only have to 'update them rather than have to build them again.'

She describes her colleagues as being 'afraid' of computers, and seeing much ICT as unreachable in terms of the skills needed to use it, but Rosa disagrees: 'They think that it makes life more difficult but it's vice versa'. Rosa has attended quite a few courses at OUCS to improve her ICT skills. She feels that greatest, and indeed only, support she gets is from the Computing Services because she knows 'people there personally' to ask questions. She feels that there is little interest in her own faculty. She has tried a number of times to bring up the idea of an 'IT and teaching working group' but has been met with little enthusiasm from the IT committee. She wants to further her ICT and teaching skills and teach people what she has learned, saying 'if they saw how practical and enjoyable it is they would be interested.' She has asked to join the IT committee but again has had no response and feels that this may be links to her gender and her age. She feels annoyed that she cannot share her ideas and learn from her peers.

When Rosa has a new idea concerning ICT she first tries the relevant technologies herself to see if it is practical and feasible. She asks people who 'know IT' for advice. Rosa is pleased that she has successfully been allocated development time from the University's Academic Computing Development Team (ACDT) to develop some language-learning games, but this is an issue that her project requires web hosting. As

her faculty do not have a server she may be forced to use the VLE which she feels will not let her do what she wants to do with her project. Rosa feels that there are not enough incentives for individuals to develop the use of IT in their teaching: 'they won't use it if it means extra work with no reward, not unless they are really passionate about it'. Rosa really wants to start to use 'digital books,' films and TV to help her teach Turkish language and culture, but she has nowhere to store these objects (the files being too large for the VLE). She also wants to create Flash quizzes as a means of formative assessment. She has them on paper but does not know how to transfer them to a computer.

4.1.2 Vignette 2: Peter

I have chosen Peter as a vignette to illustrate a less dramatic uptake of ICT for teaching and learning. Peter is a university teacher in physiological sciences. He gives roughly 15 lectures a year, runs practical classes, and supervises undergraduates, and the occasional graduate. He is also a tutor in physiological sciences at his college, where he sees 12 undergraduate pre-clinical students at least once a week throughout their first year and very frequently thereafter. He runs the non-medical physiological sciences course and teaches both medical and non-medical students.

Peter uses ICTs to aid in the administration of his teaching. He uses a departmental tutorial booking system which permits students to book slots and download relevant materials for the tutorial (e.g. reading lists). He finds the system quite 'clumsy,' taking a couple of hours to enter a single term's tutorials, which he considers 'too long'. He says 'it's quite tricky, more academics would use it in our department division if it was easier to enter the reading lists.' He uses word-processing software to write all of his college reports and answers a lot of e-mail queries from students.

Peter creates his reading lists in Word and uses a DOS-based program to store his references. He annotates his reading lists to indicate to students which readings are essential. He sporadically updates them and often adds more up-to-date references from an online medical bibliography called Medline a few days before the associated lecture. He finds linking directly to the online databases from reading lists unproductive as it stops the students learning how to use the online databases for themselves.

Peter describes the teaching of physiological sciences as primarily the teaching of facts:

I don't know how many Latin names for different parts of the body they have to learn but it's an awful lot, and when they've done that they have to learn the same number of Latin or Greek names for different chemical intermediates and other things.

Peter feels that ICT could pose as a solution to easing this burden, making it 'more fun.' Peter takes this concept into his lectures and uses power-points containing humorous cartoons included to 'liven up' the lecture, saying that 'it makes them remember the boring stuff.'

Peter expresses that he strongly believes in active teaching - 'getting them involved and doing things,' although he considers this 'not very IT-ish.' He says that his lectures usually have a high degree of interactivity incorporating what he calls a 'Quizzzy' (an on-the-spot mini-quiz), and debates. Peter's perceptions of the benefits of active teaching relate to his own learning experiences:

What do I achieve through active teaching? My discovery of active teaching was in California when we had these mid-term exams, they had exams every three weeks, I came from England where exams were finals and were monumentally terrifying, so I approached exams far more seriously than anyone else did. And my way of preparing, and I don't know where I got it from, was to rewrite all my lecture notes within twenty-four hours of going to the lecture, I would boil the lecture notes down actively thinking about them and simplifying them. It was fantastically powerful, there's something about reading the notes and it goes in to your brain, and then it comes out and it goes down your hand on to the paper and you see, you move the hand with the brain and you see the words coming out, and it goes back in the other end. It's recycling the same things around and around. And I did very well in those courses, in fact I was usually top by some margin. And I insist that all my students bring me, at the end of their first week, examples of lecture notes that they have taken home and rehashed. It's not particularly creative, but it works like anything, it means they find out what they didn't understand. They may have thought they understood the lecture, but when they actually go through it and try to rephrase things, they discover that they don't quite understand everything. That was the one realisation of how to get an awful lot of material in to you, you know, that's one form of activity.

When considering how ICTs could be used for active teaching Peter says that ‘in terms of active teaching and interaction, well I guess that the degree of contact time the students get exposed to here reduces the need for things like discussion boards and online quizzes; they get all that from their tutorials’.

Peter has developed two major ICT projects. The first project was a course evaluation system to collect feedback from the students. Previously the system course evaluations had been done by hand:

[I]t took an afternoon plus some to collate twenty handouts. All the ticks, adding them up mindlessly, one, two, three, four, five, for different qualities of lecture, and then doing the means and standard deviations in Excel and then writing a report for the next term...there had to be a better way.

Equally unsatisfied with the functionality in the institutional VLE (‘It took four days and was horrendous’), Peter decided to create a new system. With previous programming experience and ‘wanting to learn a higher level Windows-based language’ he developed the course evaluation tool as a project to teach himself a new programming language. The tool has been used to collect feedback a number of times and Peter believes that the course feedback has improved as a result:

You just go click, click, click, click, click, four minutes and you can write, there's lots and lots of boxes for comments, and for some reason it really attracts comments... I'm terribly pleased with it because it really is instant and it really has worked

The second project Peter developed was a simulation called ‘TeaLeaves’. The simulation is designed to encourage students to look ‘creatively’ at respiratory and cardiovascular traces obtained from human subjects exercising on a bicycle, and to ask and answer physiological questions about relationships between the behaviour of the lungs and heart. It is called TeaLeaves because it is intended to help students see things that may (and occasionally may not) be there, and to test predictions about what they see. Like the course evaluation project, TeaLeaves addresses a specific problem face by Peter in his teaching:

There are many many fewer practical classes than there used to be, it's too expensive and when the med student numbers went up from 100 – 150 it was decreed that we could no longer run practical classes for any one after the first year, there just wasn't enough space or money. And a part of what you get out

of a practical class is putting things together, building equipment and making things work which has gone. But the other part is looking at the experimental results that you have got and saying what the hell do they mean and that's what this is doing. This is taking real experimental results rather than computer generated ones, with all their shortcomings, with all their noise, and encouraging people to look more closely at them and to find out what's going on.

4.1.3 *Vignette 3: Margaret*

Like Rosa, Margaret is also a lecturer in Turkish language and culture, however Margaret has very different experiences of using ICTs and has been chosen as a vignette for this reason. Margaret also teaches Turkish literature, modern history and intellectual history in addition to language and culture, both at undergraduate and graduate level as well as supervising a few DPhil students.

Margaret says that she has a great deal of administrative tasks, mostly related to teaching, which take up a lot of her time: 'I spend a lot of time contacting students to rearrange meetings . . . when students come from a number of different courses it's very time-consuming to reschedule':

I mean it was impossible before email, but even with email the way it works is the way most of us do it though I know there are better systems is by emailing everyone and saying, "Look I can manage the following times, let me know which of those times are possible, impossible or best for you." and you wait and you get it back and not everyone can do it and so you try again.

Report-writing is also a lengthy process:

[V]ery time-consuming, what's the most time-consuming things about them? [pause] Well, yes, the, the form itself comes in about four bits. Um there's the one that you actually do the report on, but the calculations that they require in terms of um how many hours with how many people um have some really tricky aspects to it. Because if, for example, you've got four students, and they're at three different colleges, you've got to try to apportion the amount of money that you're claiming from that particular college. I mean they expect you to do, to do that yourself. You can't just say I've been supervising your two students, x and y, in a group of four. They want you to sort of do a calculation to work out what sort of notional number of hours to charge for per student.

Margaret says that on average each report takes about two hours to compose. She now uses a word processor to write the reports, previously writing them by hand: 'this has

made things somewhat easier; I mean I can copy and paste bits like the course content into each report rather than re-write it every time. Also, I can save a copy on my computer rather than paper copies. Yes IT has made things better there’.

Like Rosa, Margaret’s teaching is mostly ‘class based’ with a large number of staff contact hours. Margaret describes her way of teaching as varied. For a grammar lectures she distributes handouts (mostly reading lists and extracts of grammar textbooks) which she has compiled in Microsoft Word. In class she uses the whiteboard to demonstrate language rules, and sometimes uses an overhead projector to show maps and images. She feels that her lecture technique could be improved and wishes to learn to use PowerPoint so that she can provide a visual ‘route map’ to her lectures and easily re-edit the content every year. In class students take turns to translate texts to which Margaret provides oral feedback. In tutorials she goes through essays or translations that her students will have submitted in advance, either via e-mail or her pigeon hole. Margaret makes annotations to the hard copy essays via hand and students will take further notes in the tutorial.

Margaret is contemplative when discussing the course aims. She perceives different aspects of the course as developing different skills in the students:

I: And what are the course aims in terms of student learning?

That is a difficult question to answer. I mean what’s the aim of teaching in general? [Pause] I mean all the students that I teach, well, let’s focus on the undergraduates, they’re studying Turkish for a degree in Turkish so they’re expected to acquire a very precise understanding of the language so that when they read texts they understand I suppose what you would call it the ideational meaning, the actual sort of content meaning of the text but also the tone, the image which is being delivered, the, the level of register which is being delivered that sort of thing. That’s, that’s purely the language side. Then with regard to these texts that we read the study of the literature clearly is intended to, I mean the study of the literary texts is intended to give them insight into Turkish literature and be able to debate and discuss it with a knowledge of the language. Why does anybody study literature?

Margaret feels that it may be advantageous to put her teaching materials online in the VLE for her students to access but she has heard from her colleagues that it is a ‘bit complicated’ and will take time to learn. However, she imagines that it is ‘one of

those things that, once you have learnt it, it could be labour-saving both for oneself and for the students'. Time is the main barrier to Margaret improving her IT skills – 'during term time I can hardly breathe.'

Recently, Margaret has been using Google to check whether certain constructions of the Turkish language are possible. By putting in word combinations and seeing what google returns, she has found that the system has become a 'source of real language texts'. Margaret started using the Internet about 8 years ago and expresses that is becoming quick source of information for her and she has found out about various useful web sites from colleagues and students.

There is a faculty system for collecting student feedback. Every term one of the departmental administrators e-mails Margaret's students a word-processed evaluation form which they are asked to return by person or by e-mail. They have a very poor response rate and Margaret has never received any feedback herself from this system.

4.2 Patterns of experiencing ICTs

Rosa, Peter, and Margaret's descriptions of their uses of ICTs in teaching had a number of features in common with the other university teachers interviewed. Like Peter and Rosa, three other interviewees had been involved with specific ICT innovation projects of varying complexities. Others had taught themselves various packages to enhance their teaching materials, while some, like Margaret, had used a smaller selection of more administrative technologies to 'make life easier'. However, for all of those interviewed certain ICTs had become part of the blend of their everyday working practices. Nearly all of the respondents commented that they would frequently direct students to useful URLs or library Internet resources, use online catalogues to find resources, and use e-mail as a first port of call for communication.

According to their accounts, interviewees told of how they used technology most were to aid the administration of teaching (producing course materials, contacting students, collecting course feedback), or to enhance learning (use of PowerPoint in delivering lectures, online reading lists, formative assessment) rather than to substitute any part of it. While Rosa embedded technology extensively in her

teaching, it was still additional to the traditional teaching techniques of the lecture and the tutorial. Like Rosa's, the ICT innovation projects which other interviewees had been involved in, were 'add-ons' to enhance traditional teaching practice. These included online formative multiple-choice questions (MCQs) to aid revision by David (philosophy) and Chris (business studies); and the use of flash animations to teach chemistry by Stuart. Peter's TeaLeaves project was an exception within the group in that the project replaced a practical class.

4.2.1 Use of the institutional VLE

WebLearn is currently the preferred VLE system supported and hosted by the University. The interviews revealed a great deal of awareness about the presence of WebLearn, with four of the interviewees using it to host materials on a regular basis. Others, however, had little practical experience of using it and three of the interviewees used alternative departmental or college intranets instead. In all instances WebLearn was used purely for the administration of course content rather than for any form of learning activity.

4.3 Patterns of experiencing teaching

Experiences of teaching at Oxford tended to focus on the tutorial, a technique that largely consists of the tutor teaching a student on their own or in a small group. At Oxford the tutorial largely consists of a tutor exploring a topic in greater depth with a student face-to-face, this may be through discussing and debating essays, problems, or readings. The majority (seven) of university teachers interviewed held regular undergraduate tutorials on a one-to-one basis, the remaining held slightly larger tutorials with two or three students at one time. In relation to the aims of the tutorial, comments included: 'enabling each student to learn at their own pace;' 'giving immediate feedback' on a student's work and performance; 'two minds working on the same problem;' 'guiding intellectual growth;' and 'an academic demonstrating scholarly skills to enable the student to become an academic themselves.' In the interviews the tutorial was seen to focus on the individual student, assisting them to develop their own learning style, directing them in their studies, but also giving them some freedom of choice in what they studied. June, a tutor of religious studies, commented 'I give them a range of essay titles so they can think flexibly around a particular subject; it gives them mental agility'. The tutorial process puts student and

tutor face-to-face in a way that is affected by distinctive personalities and approaches, and thus becomes a highly personalised learning experience.

A number of the interviewees expressed that the role of the tutorial was not to deliver information or facts, or to bring students 'up to speed' for their exams; rather, it was to 'contest knowledge' and 'articulate argument', fostering in students scholarly skills so that in time they would become less dependent on their tutor's guidance. This opinion, however, was not shared across the group, and others indicated that knowledge was accumulated rather than challenged, within the tutorial process. For instance teachers from chemistry, medical sciences, and philosophical logic felt that the main aim of the tutorial was to go over particular problems that the students were having with the course material. Some interviewees also commented that there was a fine line between the tutorial essays and the examination questions:

June: I give them alternative questions which are often from previous exam papers, because I say to them, "you'll never get exactly the same question I'm giving you on an exam paper, but, and as you approach the material you need to have a flexibility of mindset about the issues involved in this week's work".

Alice: I do give them past exam questions in the tutorials. If they can get feedback from me then they will be able to go into the exams with more confidence. I guess that this is not really the Oxford way, but it's what the students want. They want to pass their exams.

The tutorial was perceived to be at the very heart of the teaching experience, with other aspects of the learning environment, such as lectures, classes, labs and private study, feeding into it. Experiences of group teaching were largely more information-focused. Interviewees commented that they gave traditional 'performance style lectures': 'it's just me at the front talking really'. Some interviewees broke up their lectures with activities and used visual stimuli like Peter had described, but there was usually little room for discussion or debate, in many cases because the group was too large to do this effectively, or because the students were unresponsive. As one teacher commented:

David: Once upon a time I left a time at the end of the lectures for people to ask questions, no one ever did. And so there was just no point. And now what actually quite often happens, is that they wouldn't ask questions um actually

when everyone else was there but they'd come up after the lecture and ask the question, which they much prefer.

Lectures were largely seen as a means of delivering facts and information to the students, the tutorials as a place to articulate understanding and critical thinking.

4.4 Patterns connecting experiences and perceptions of teaching to experiences and perceptions of technology

Overall, relating teachers' perceptions of teaching to their use of ICTs through the transcripts was a complex task and varied immensely within the group. After the process of analysis four main themes in particular emerged from the interview responses of the group. Discussed in order these are; face-to-face interaction versus virtual interaction; dependence versus independence in learning; knowledge versus information; and lastly old versus new teaching styles.

4.4.1 Face-to-face interaction versus virtual interaction

A significant theme that emerged was a concern about the potential reduction of face-to-face contact if ICTs were used increasingly for teaching. Oxford University has a favourable tutor-to-student ratio and teachers perceived the majority of their teaching commitment as organising and holding tutorials. They expected to have a high level of face-to-face contact with their students, and said they believed that their students felt the same way. Further, face-to-face contact was considered to affect a student's motivation to learn in a positive manner:

I: Why do you feel that a tutorial is beneficial?

David: It's important that the student has the opportunity to develop their knowledge of the subject physically with some one who can push them and take them down different avenues of understanding. Through having tutorials the student is motivated to read, prepare and write and this is constant throughout their university life. Um, it's a lot of pressure but that's what makes these students so successful isn't it.

One interviewee commented that what online learning environments, like VLEs, were in effect trying to achieve was the contact that one gets through the Oxford tutorial:

Stuart: The majority of VLEs are trying to replicate online the Oxford tutorial, effectively we have it so we don't need to replicate it online, it's as simple as that really. The VLEs are just ways of engaging students in a one-to-one way with either themselves or with a tutor, that's really what most VLEs dream of having, the sort of interactivity of an Oxford tutorial. We already have that here, and I think that's difficult to do.

The perception that ICTs could not replace or enhance what Oxford already had in terms of the tutorial was widespread across the group. Teachers often mentioned that they were 'sceptical' about the advantages of using discussion tools in this environment, and that they were 'not convinced' of the benefits any form of online interaction could bring to their teaching and their students learning. Some teachers who had tried online discussion forums, or had seen their colleagues do so, commented that online discussion facilities would not be used as students social networking patterns were already well established, largely due to the collegiate structure of the university. Comments included:

Peter: We've made available things to discuss but they don't really get used . . . So they must have other mechanisms, social networking which they think are more amenable.

I: Do you think that's something that's kind of specific to Oxford, or do you think it's more general?

Stuart: I think it's very specific to Oxford. I think it's because the relationship that the staff have with their small group of tutees means that the discussion board, for example, is completely resented within our general courses within Oxford. . . your community of students is fairly collegiate, so they help each other out who are the same halls of residence, they certainly don't have a community feel for the whole course...if there isn't a big community, having a discussion forum would fall apart, I think.

In those subjects heavily reliant on fact (chemistry, Turkish studies, physiology) more debate and discussion were not perceived as aspects of learning that would be beneficial; for instance, one chemistry teacher commented:

Stuart: The opportunity to have a discussion in there is limited really because either the student knows what you are talking about or needs help...whereas in many other subjects, for example English, you can debate about what an author wrote in his book...it's debatable and it's not in chemistry and not in a lot of the sciences.

Interviewees felt that there was no real need to ‘rescue students from their loneliness’ as students were placed in highly supportive and effective networks consisting of their tutor and their college peers. When engaged in lecturing to much wider groups some interviewees commented that they had used e-mail lists, or created question and answer web pages, to answer any questions concerning lecture content. However, more often than not these points could be clarified in tutorials and these mechanisms were largely unused or not needed.

Further, often entwined within the role of tutor was a more pastoral aspect of general support and care of the student through their academic career, and it was not seen as desirable to use technology to provide this. Many of the group felt that they had come to know the students whom they tutored. By providing other forms of interaction new technologies challenged the very basic formulae of what ‘makes Oxford work’, and a shift to new technologies for communication purposes would require an organizational change that saw the dismissal of the tutorial, an aspect of teaching that many of the group felt was an important aspect of their professional identity (the group regularly referred to their role as ‘tutor’ rather than ‘lecturer’ or ‘teacher’).

In the case of graduate students, some of the group felt that there could be scope for using technologies to aid communication, especially for doctoral students. Interviewees met their graduate students on a one-to-one basis much less regularly (once or twice a term), usually to discuss research projects rather than any form of teaching they were receiving. Communication between tutor and student was largely conducted through e-mail, and efforts were made in some disciplines to place research students in groups with other students covering similar topics. These met on a regular basis or, in the case of science subjects, shared the same laboratory. However, connecting to the theme of independency of learning discussed earlier, tutors also felt that at this stage students should not rely so much on the support of their tutor, as Phillip states: ‘they can’t have the sense that we are permanently available’. Those interviewees who felt they would consider using discussion facilities were sceptical of the amount of time that they would have to commit to make them beneficial.

4.4.2 *Dependence versus independence in learning*

Commonly recurring themes in the interviews were those of dependency and independency within student learning. Teachers who held the perception that teaching was about guiding and assisting students to develop understanding, knowledge and techniques felt that increasing uses of ICTs would ‘spoon-feed’ students, encouraging forms of dependency. As the teachers’ experiences of ICTs were largely as information delivery systems, rather than activity-based learning tools, ICTs were seen to encourage passive learning. An important aspect of developing a learning style was the ability to be able to conduct ‘independent research’, learning to use online databases and bibliographies to find relevant material and explore connections between them, rather than being given links to such resources directly. An example of this are some of the interviewees’ comments about electronic reading lists which contained hyperlinks to journal articles:

Peter: I’m adamantly against linking the references, I find it tacky and counterproductive, you know. How are they ever going to learn to find things for themselves?

Phillip: Lets say I create those reading lists with embedded links to journal articles, surely one of the by-products of that is that they no-longer have familiarity with using a catalogue, and one of the things I would like them to do is find out things for themselves . . . it’s a generation of students who think that research consists of going to Google and pulling something of the internet, that that’s what research is, and it’s profoundly alien to what we do. Although I’m very much in favour of electronic resources, there are still quite serious issues about how people learn from them, the relationship between the electronic world and the learning process.

Chris: Finding resources yourself rather than linking directly to them, well I find that it’s a scholarly skill to be able to do this, you know, people are astonished sometimes that you can find stuff out, for example, about companies that we’re dealing with. But if you’re a bit more persistent and you spend a bit longer at it and a bit more systematic, you can actually find all sorts of stuff out that the lazy person can’t. I think also there’s an awful amount of skill in searching and we don’t actually teach any of our students, even research students, how to do it very effectively. So that’s possibly something we need to think more of.

An interesting comment was made by Phillip, who expressed the concern that new means of communication afforded by ICTs (e.g. discussion boards, synchronous chat rooms) would actually encourage the students to depend more upon their tutor:

[T]here is something about the electronic world which determines what I call the open beak, little birds in the nest with their open mouths expecting things to be dropped in. And that is something that ever more rapid communication does, because then people expect instantaneous responses to every kind of enquiry...they can't have the sense that we are permanently available, as it were, permanently downloadable.

Interestingly, none of the interviewees voiced the opinion that ICTs could encourage students to take responsibility for their own learning. Being able to 'develop' learning styles and techniques, conducting 'independent' research and developing 'complex understandings' was seen to be very much a part of the 'Oxford experience'.

4.4.3 Information versus knowledge

A further important pattern that emerged from the interview responses was the perception that information differs significantly from knowledge, and that only a real teacher can guide a student. As discussed previously, the role of teacher as tutor is largely experienced as assisting the student in constructing and contesting knowledge and in developing learning styles through guidance, tutoring and personal attention, not by disseminating information. The boundless amount of information available on the Internet might enrich what is learnt from a teacher but it does not substitute it for the latter. This was expressed by one teacher's comment on the problems of using the Internet as a mechanism for resource discovery:

Phillip: I suppose the majority of students do it all on Google and think that if it doesn't come up on Google, it ain't there. Well, of course, many bibliography results don't come up on Google searches because Google can't drill into the database. ... This is a problem. There's an awful lot of stuff, high grade material, that students won't get through Google... It's more about how you train users to develop the skills of a scholar and how to process that information. Because information isn't knowledge, you can't develop complex understandings of information just by looking on the Internet.

Information is more accessible through the Internet, but a teacher is needed to help mould this into meaningful knowledge.

4.4.4 Old versus new teaching styles

Although, Rosa and Peter both conveyed that their teaching styles had changed to encompass new technologies in their teaching; this shift in method was raised as a concern by a number of the other teachers interviewed. Many of the teachers felt that ICTs would bring about a change in their roles within the teaching and learning

context. However, perceptions varied as to what those changes would be. Interestingly, in contrast to the perception discussed above that ICTs would not encourage an independent and self-conscious learning style, some teachers voiced a concern that technology would reduce their control over the learning situation:

Alice: I don't like to spoon feed them but I don't want to give them too much freedom to teach themselves. There is so much information available on the World Wide Web and many of them don't have the skills to assess what is scholarly and what isn't. I mean I need to know what they are doing so I can guide them. If it was all virtual that would be more difficult I think.

Other teachers feared that an increased use of ICTs would force a greater focus on administration rather than teaching within their work. Comments included:

June: I love tutoring. I don't have to give many lectures and I'm not engaged in research so it really is my main activity. I could use IT more than I do and I imagine it would be quite interesting but the thing is I like how I do things now. I don't want to have to shift from that to spending more time preparing materials and e-mailing, that would take time away from actually working with the students and that is what is really important.

Karen: Research and the administration of running a research group is my main role and second to that, a long way away, is teaching...as far as I'm concerned more IT means more admin and I really don't want to do any more of that.

I: Why do you feel more IT would mean more admin?

Karen: Well I'd have to learn the technology, then set up all the stuff in WebLearn, give all the students instructions, constantly check e-mails, discussion things, check it was working as it should be. It's a lot of work.

The online university teacher takes on the roles of facilitator, administrator, technical support and evaluator, the focus in this change is seen to shift away from the student to the general running of the course.

4.5 Principle motivations for university teachers to adopt, or not to adopt, ICTs in teaching and learning

In addition to the above themes, a number of other points arose specifically in relation to motivations for adopting, or not adopting ICTs in teaching practices.

4.5.1 Principle motivations not to adopt ICTs in teaching

In addition to the concerns emerging in the themes discussed above, other barriers for using ICTs for teaching and learning were: demands on time; lack of incentives for using ICTs; lack of evidence in terms of educational benefits; and lack of technical infrastructure, skills and support. Some teachers perceived that ICTs would require a greater amount of administration, both in authoring teaching materials and in maintaining an online environment. Whilst Rosa felt that in the long term ICTs had helped her to reduce her workload, other teachers who had incorporated technologies within their teaching felt that it had been far more time-consuming, especially when used as a supplementary teaching method. Chris discussed his worries over another university teacher who was assisting him in creating formative online MCQs for undergraduate business studies students:

Well one of the things is just finding the, you know, the time to do it. He was just coming up to tenure at that stage and it was very vital he finished the book. And he is a sort of obsessive, when you saw the things he did, they were all immaculate and beautifully done because he spends lots of time on that sort of stuff, and this could have become a tremendous displacement activity for him. I wanted him to focus on his other work... You know, I wish we had the resources to do more but it's absolutely not an IT issue, it's just having the people around to do it.

Similarly, Phillip admitted to difficulty finding the time to create online materials for his students:

I'll get it and I can do it when I can, which is probably going to be in an evening, not in a daytime because there's no time in the daytime, for me anyway.

Like Margaret, other interviewees were interested in increasing the use of technology in their teaching but were discouraged by the increase in workload they perceived it would demand. As Karen commented:

I need to start using the WebLearn. Students are starting to expect it you know, having access to handouts, reading lists ect. online, but I've heard that it's not that easy to use and I just don't have the time at the moment to sit down and work it all out. The amount of administration I have to do for my research group is massive, and that really takes up most of my time.

A lack of incentive for using ICTs was also a key point raised by some of the interviewees, in terms of both staff and student commitment. There was a general

feeling that teaching and learning were held in low self-esteem in comparison to research activities, which were generally rewarded with promotion. Chris discussed the response of his colleagues to the e-learning MCQ project which the department had undertaken:

The main response from the School officially was great – ‘we can tell people that we’re doing something on e-learning’. But I think most people were thinking in terms of well that sounds like a lot of work, what do you get out of it, you know. And because I think it is something that that you're doing for just pure educational benefit and not even for all students, many of my colleagues would say well why bother. But generally it just reflects of course that there is no instrumental value in interesting in teaching because no one appraises you or evaluates you on teaching.

In terms of the benefits that students could gain from using educational technology, most of the teachers interviewed did not perceive any clear obstacles or barriers to which ICTs could provide a solution. Chris also raised the issue that, while the online MCQs had been ‘a valuable adjunct to learning’ for some students, he explained that this was only for students who felt the need to test their knowledge: ‘I’m sure many students just wouldn’t bother to engage with it routinely’. The question of whether a student would feel motivated to engage with online formative assessments is closely connected with the perceived educational benefits of using ICTs within the Oxford educational system. As Stuart succulently summarised:

The question is why would students do them? At other universities, I think you can be far more creative in how you give students credit for what they do. There is zero opportunity or very little opportunity to have that here, because we don’t have continual assessment in any of our courses, whereas almost every other university probably does. So therefore using multiple choice, what’s the incentive to do it if you are not getting any credit? OK, the incentive is that a student might think they’re going to learn something, but that’s not everyone, and the way we teach the subject is very much self-discovery in textbooks really...And what’s the driver for change, our students are quite successful at the end through using our tutorial system, why should we change to do something else when they actually learn quite effectively by telling them they’re going to have to write an essay on such-and-such by next week? It’s quite a high pressure way of teaching the subject because they have to go away and research it and come back and be knowledgeable about that subject. And would you get that same knowledge if you just gave them some multiple choice questions? No.

There was also some concern over the technical infrastructure and support needed to use ICTs within teaching. Four of the interviewees commented that the lecture theatres that they used were not set up with the data projectors or the Internet connections that they needed to use technology in their lectures. Some teachers also voiced their concerns over dealing with ‘technical glitches’ that may occur when using ICTs for teaching and confessed to a fear of appearing to look incompetent in front of their students:

David: I had problems with the data projector on a number of occasions and one student commented on this in their end of term feedback. I thought this was a typical smart arse in their first term knows everything and thinks of people of 60 haven’t any idea how to use equipment. It did put me off.

Some interviewees perceived the support to aid the implementation of ICT into teaching and learning as inadequate. For instance two of the interviewees who used WebLearn were discouraged that they had to use a mailing list to have their questions answered, preferring support on a one-to-basis. Others felt that they required more pedagogical support rather than technical support, as June stated ‘Well, I’m sure I know how to use some of the technology already, or it would be easy enough to learn, but I wouldn’t know how to use it you see. How do I know where and when I should do it?’

4.5.2 Principle motivations to adopt ICTs in teaching

All those interviewed who had used ICTs were asked what the main motivations was for implementing them within their teaching. The responses could be classified into four areas: addressing a practical need, enriching course content, personal rewards, and institutional recognition.

Peter and Rosa shared a common theme in their reasons for adopting ICTs - each had experienced situations in their teaching that had required them to look for enhancement from elsewhere. Peter needed to substitute lab activities and Rosa needed to address a lack of material available to teach Turkish studies. Others had used ICTs to ‘liven up’ or ‘enrich’ their teaching, through the use of PowerPoint presentations and multimedia to make the content more ‘interesting’ for their students. As Chris commented on his use of electronic visual aids in his lectures:

Pictures break up all the words, because I think if you have too many words and slides it makes it hard to digest. I use a lot of video clips too, they serve as pure breathers, just really to break up the flow of the lecture, give people some intellectual relief, something else to look at. Some of them are useful because they are provocative in their own right and, you know, they help get people thinking.

Another main motivation discussed in the interviews was the personal reward teachers received from using ICTs. Some interviewees cited a personal interest in using technology as reason for adoption, and some their interest in teaching issues, often prompted by professional certificate in teaching in HE or a similar course. Some institutional rewards, such as available funding or development time, awards for best practice, or the occasional committee responsibility or post, were mentioned. However, it was evident that institutional factors were not of great importance in motivating the more innovative teachers to use ICTs.

4.6 Summary

The results from the interviews were varied. They showed the many different ways that the teachers used ICTs in their work, and highlighted the tendency within the group use technologies to enhance and enrich learning rather than to transform or substitute it. Perceptions of teaching, learning, and ICTs clearly influenced the ways in which the teachers used technology, and in many cases perceptions were highly influenced by the established Oxford pedagogy of the tutorial. Although perceptions were multifaceted they largely revolved around notions of interaction, dependency, information, knowledge, and professional identity; allowing for the identification of some common themes. Additionally, the findings from the interviews highlighted some principle motivations for university teachers to adopt, or not to adopt, ICTs in their teaching. Time; lack of incentives; a lack of evidence for educational benefit; lack of defined problems; and technical provision and support; were seen as barriers to the uptake of ICTs; whilst, practical need; enriching course content; personal reward; and institutional recognition were seen as levers to adopt ICTs.

Reflections

In my introduction I explained that I wanted to conduct this study as a way to explore qualitative interviewing as a method of data generation, and also as a means of providing context and ideas for future research. In this chapter I will revisit and reflect upon the methodology that I used and reflect upon the research outcomes in Chapter 4. I will consider how the outcomes contribute to our further understanding of university teachers' adoption of ICTs and then I will outline some implications that this study will have for future research in general, and for ICT implementations, in teaching and learning in Oxford University in particular.

4.7 Reflections on the methodology

I found the use of the case-study strategy and qualitative interviewing especially appropriate for exploring individual experiences and perceptions. However, as the interviews were the only method of data collection in this study, this put pressure on me as the interviewer to follow up and explore responses at the time of conversation, which was not always possible. When listening to the recordings of the interviews and reading the transcripts, I noticed that my interviewing technique improved with each interview; my prompts became more standardised and I responded with less leading questions. This lack of standardisation throughout the data collection however is an issue for concern. It raises the questions of reliability addressed in Chapter 3, and increases the opportunity for bias. I also felt that at times the interviewees' responses would have been enriched with further data collected by other means, such as observation of a lecture or tutorial. As a result of my experience of using in-depth interviews as the main mode of data collection, I intend to gain additional insight by combining this technique with other research methods such as observation and approaches to teaching inventories (e.g. Prosser and Trigwell, 1999) when conducting my doctoral research.

With ten interviews and an immense amount of transcribed data it was difficult trying to maintain the balance of individual narrative providing a 'thick' description, and the reduction of data to tease out common themes for analysis. I found it problematic to embed the interviewees' comments within their own personal context, and I addressed

this through the use of vignettes, as well as extensive quotes organised by theme. In future research, if I amassed larger amounts of interview data, I feel that this structure would be an appropriate method to use to report the findings.

Although pseudonyms were used instead of the interviewees' real names, the use of the detailed vignettes and the linking of interviewees to their discipline made it possible, for the reader familiar with the Oxford e-learning community, to connect opinions to individuals. However, to disregard subject area and variation, and to concentrate on themes and ideas, would have made the delivery of the findings less insightful and the style of the writing awkward. This will need to be addressed in greater depth in future research if anonymity is to be offered to the respondents.

4.8 Reflections on the findings

The themes and patterns drawn out from the interviews were fairly broad and tentative. The analysis is very much my own as the university teachers did not have the chance to comment upon my notes. My objective was understand the context I was researching in greater depth, and to present the findings in such a way as to aid naturalist generalisation from the reader. It was also raise ideas and notions that would be interesting outside of the case study context.

I found that I gained a substantial impression of experiences and perceptions relating to teaching, learning and ICTs from the interviewees' responses, and most of all an understanding that these experiences and perceptions are often complex and multidimensional with undertones that need further probing. The findings from the interviewees showed that the teachers' perceptions of teaching, learning, and technology play a significant role in their subsequent use of ICTs. By showing that ICT uptake is closely interwoven with teaching and learning techniques and perceptions, has significant implications for future research and e-learning projects.

4.9 Reflections on the study and future research

The findings of this study are relevant to the dissertation title; they form a 'connection' between technology and university teaching. The perceptions that the university teachers held of teaching and learning often explained their adoption, or

non-adoption, of ICTs. If it is desirable to embed ICTs at a greater level then these perceptions can not be ignored. I feel that the data gathered and presented provides an interesting platform from which to discuss the roles of ICT in teaching and learning at Oxford University, and I hope it will initiate debate amongst those involved in its implementation.

It will be interesting to see how OUCS and the LTG respond to this dissertation, whether it will influence practice or simply foster awareness. The evidence shows that we need to understand and be sensitive to university teachers' perceptions in order to offer an appropriate service, and cultivate a culture for ICT innovation. Many of the issues that have come out of this study have not been about technology per se, and it is clear that the e-learning community need to work with other groups within the university to address any underlying problems. What is more evident, however, is that we should not presume that technology is always 'the answer', as seen within the interviewees' responses often there is not a question or a problem to be addressed. I am sure that many of the themes raised in this study have not been available for consideration until now, and a greater awareness of them will be a positive step to forge a deeper connection with the academic community.

I enjoyed the process of meeting the university teachers that I interviewed and because of my 'insider' role I anticipate that I will continue to meet with them in the future, especially those who have been involved in ICT innovations. I will be pleased if they choose to pick up this study and read it, I have attempted to be true to the data at all times and feel that I have treated all opinions without being too judgemental. As outlined in Chapter 3 I have been aware of the sensitive nature of university teachers providing information on their perceptions and experiences, and I have tried to retain anonymity throughout. However, any reader who feels they can relate descriptions and comments to individuals should ground their views within a previous and whole knowledge of that person, and not in the way I have recounted them.

The next stage of this research is to explore the connections between technology and university teaching in greater depth, using a mixed methods approach with the aim of making specific recommendations to close the gap between policy and practice, and advance innovation. This dissertation provides a firm basis for this future study.

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Appendices

Appendix 1: List of Acronyms

ACDT	Academic Computing Development Team
ALT-J	Association of Learning Technology Journal
BECTA	British Educational Communications and Technology Agency
CHC	Centre for Humanities Computing
CHEPS	Centre for Higher Education Policy Studies
CTI	Computers Teaching Initiative
CUREC	Central University Research ethics Committee
HE	Higher Education
HEFCE	Higher Education Funding Council for England
HCDT	Humanities Computing Development Team
HCU	Humanities Computing Unit
HEA	Higher Education Academy
ICT	Information Communications technology
JISC	Joint Information Systems Committee
JTAP	JISC Technology Applications Programme
LTG	Learning Technologies Group
MCQ	Multiple Choice Question
MLE	Managed Learning Environment
OTA	Oxford Text Archive
OUCS	Oxford University Computing Services
QAA	Quality Assurance Agency
RAE	Research Assessment Exercise
VLE	Virtual Learning Environment

Appendix 2: Interview Schedule

1. Please can you describe your work to me?
2. What do you think generally the course is about?
 - a. What are the learning aims of the course?
3. What do you do in lectures?
 - a. Can you describe how you use a computer in the preparation or delivery of lectures?
4. What do you do in tutorials?
 - a. Can you describe how you use a computer in the preparation or delivery of tutorials?

(Repeat above questions for other forms of teaching (e.g. labs, classes))

5. Are there any other aspects of your work in which you use IT?

Additional questions where an ICT innovation project has taken place

1. When did you start using ICT in your teaching?
2. Can you tell me how the project came about?
 - a. What was the intention / purposes?
 - b. What were the pressures, inducements, opportunities?
 - c. What support did you receive (departmental, institutional, funding, other)?
3. Can you tell what the outcomes were of this project?
 - a. What were the responses to the project (colleagues, students, other)?
 - b. What did you gain personally from this project?
 - c. Has there been any form of evaluation of the project?
4. Did you experience any obstacles in developing this project?
5. Will the project continue or be adapted?

Appendix 3: Introductory e-mail to participant

Dear Rosa,

My colleague XXXXXX from the Computing Services passed your name on to me to see if you would be willing to be interviewed for some research I am doing. I am currently investigating how academic staff at the university use Information Communications Technologies (ICTs) in their teaching. The interview will be informal, looking into issues such as how we can better support you and also what you think about ICT and how it fits into your teaching. I would like to record it if you are agreeable, and the findings of this research will be presented in such a way that you will not be identifiable.

Your time would be very much appreciated and if you are interested I hope we can set up a date and time to meet.

Many thanks again for your help,
Best wishes,

Appendix 4: Letter of thanks to participants

Dear Rosa,

Thank you very much for volunteering to be interviewed for the research project 'Connecting Technology and University Teaching'. The aim of this interview is for me to get a picture of how you are using Information Communications Technologies (ICTs) in your work at the University of Oxford and to help me identify how you are using the ICT services and tools that the university offers. This interview is part of a wider project to collect user requirements for OUCS with the aim to improve our services.

The interview will be audio recorded. If you are unhappy with this please let me know.

The findings from this research will be presented in such a way that no individual can be identified unless otherwise agreed. This research will also feed into the interviewers M.Sc dissertation and possible outcomes include publications and conference papers. All of those taking part in this research have the right to withdraw at any time and require that information given should not be used in any way.

If you have any further questions or queries please feel free to contact me, otherwise I will see you at the interview on the 12th May 2006, at your office.

Best wishes,

Appendix 5: First level coding scheme

CAT	CODE	FOCUS QUESTION
ADMIN	AD	
AD: Personal Practice	AD-PER-PRAC	3
AD: Faculty observations	AD-FAC-OB	3
AD: Institutional observations	AD-INST-OB	3
AD: Filing/Archiving	AD-FIL/ARC	3
AD: Meetings	AD-MEET	3
AD: Personnel Management	AD-PERS-MAN	3
AD: Student Management	AD-STUD-MAN	3
AD: Calendering	AD-CAL	3
AD: Preparing teaching materials	AD-TEA-PREP	3
AD: Preparing teaching materials – Reading Lists	AD-TEA-PREP-RL	3
AD: Preparing teaching materials – Lectures	AD-TEA-PREP-LEC	3
AD: Preparing teaching materials – Assessments	AD-TEA-PREP-ASS	3
AD: Preparing teaching materials – Tutorials/Supervisions	AD-TEA-PREP-TUT	3
AD: Research reports	AD-RES-REP	3
AD: Bibliographic management	AD-BIB	3
AD: collaboration	AD-COL	3
TEACHING	TEA	
TEA: Personal Practice	TEA-PER-PRAC	1
TEA: Faculty Observations	TEA-FAC-PRAC	1
TEA: Lectures	TEA-LEC	1
TEA: Tutorials	TEA-TUT	1
TEA: Practicals	TEA-PRACT	1
TEA: Class	TEA-CLA	1
TEA: Objectives	TEA-OBJ	1
TEA: Feedback	TEA-FB	1
SYSTEM	SYST	
SYST: E-mail	SYST-EM	3
SYST: WebLearn	SYST-WEBL	3
SYST: Library system	SYST-LIB	3
SYST: Online journals	SYST-JOUR	3
SYST: Internet	SYST-INT	3
SYST: Search	SYST-SEA	3
SYST: Repository/intranet	SYST-REP/INTRA	3
SYST: Word processing	SYST-WP	3
SYST: Bibliographic Software	SYST-BIB	3
SYST: Presentation	SYST-PRES	3
SYST: Database	SYST-DB	3
SYST: Assessment	SYST-AS	3
SYST: Simulation	SYST-SIM	3
SYST: Discussion	SYST-DESC	3
INNOVATION	INNO	
INNO: Project	INNO-PROJ	3
PERCEPTIONS	PERC	3, 4, 5, 6
PERC: Motivation – Personal gain	PERC-MOT-PER-GAIN	5
PERC: Motivation – Save time	PERC-MOT-TIME	5
PERC: Motivation – Problem identified	PERC-MOT-PROB-ID	5
PERC: Barriers – Time	PERC-BARR-TIM	6
PERC: Barriers – Lack of reward	PERC-BARR-REW	6
PERC: Barriers – Infrastructure	PERC-BARR-INFRA	6

PERC: Barriers – Support	PERC-BARR-SUP	6
PERC: Barriers - Skill	PERC-BARR-SKILL	6
PERC: Barriers - Evidence	PERC-BARR-EVID	6
PERC: Reluctant to use an IT although aware of benefits	PERC-IT-BEN-REL	3
PERC: Teaching role	PERC-TEA	2, 3
PERC: Teacher Focused	PERC-TF	1, 2, 4
PERC: Student Focused	PERC-SF	1, 2, 4
PERC: Learning	PERC-LEA	2
PERC: Interaction	PERC-INT	1, 2, 3, 4
PERC: Dependency	PERC-DEP	1, 2, 3, 4
PERC: Knowledge	PERC-KNO	1, 2, 3, 4
Subject: Specific Point	SUB-SPEC	1, 2, 3, 4
Oxford: Specific Point	OX-SPEC	1, 2, 3, 4

Focus Questions

1. How does the teacher teach?
2. What are these acts of teaching focused towards, what is the teacher seeking to bring about by them?
3. How does the teacher use or wish to use ICTs?
4. How does the teacher perceive the role of ICTs within their teaching context?
5. What are the particular motivations for teachers to adopt ICTs in teaching and learning?
6. What are the particular motivations for teachers not to adopt ICTs in teaching and learning?

Appendix 6: Extract of a coded interview transcript

INTERVIEWER OK, can you tell me what you think generally the course is about?

TEA-PER-PRAC

LECTURER A Yeah, yeah sure. Well the, one, ok er. In general the sort of logic that people are doing in their first year is a matter of um, um learning a logical system, a symbolic system, and learning to translate bits of English into um the symbolism of the logical system and learning how to do proofs in it and tests of one sort and another. Um with the big, the more advanced ones um do quite a lot more investigation of the mathematical properties of one sort and another of the logical system base and they, they learn about um theorems about the system. They have to be able to prove whereas, for the most part, the people doing PPE and such like er merely have to use the system to produce proofs for themselves and they don't have to produce proofs about the system um.

PERC-KNO
TEA-OBJ

INTERVIEWER Do the different course involve different type so learning?

LECTURER A Yes, yes, yes there are, I g-, well there's certainly different in the sense that um, that the sorts of learning er theorems about the system is just, is really just a variety of mathematics, um whereas um learning to translate and to produce proofs and so on is. Well in some respects it's more like learning a foreign language um. I mean that's not quite right but it has some, there are certainly some things that are a bit like, particularly a rather, well, highly structured language like Latin or something of course mostly there's much more of a vocabulary than that but some of the skills that people are acquiring are, are that sort of, but some of them are perhaps semi mathematical. I mean they learn to manipulate symbols and use proofs using the symbols and so on um. But, I mean, yeah

PERC-LEA

TEA-OBJ
PERC-KNO

INTERVIEWER So how do you actually teach?

LECTURER A [laughs] Yeah well um er ok well um. Some teaching's lecturing, so I can actually give lectures for both lots of stuff and um I also give tutorials on them um. And as far as the tutorials goes that's um, for logic, a matter of getting people to do problems rather than writing essays and the problems may be of various sorts but um, translating bits of English, explaining about the notion of the liberty and applying it to examples so they tend to be involved in quite a lot of examples, um, um. And they, it tends not to involve a huge amount of reading, so that it's very unlike the, the um other philosophical topics they'll be doing um. The other thing I, I mean the thing I get them to do always is to um, I tell them to read the rele-, to look at the relevant online um logic tutorials which are um quite similar in content to the elementary logic lectures that I give, not altogether surprisingly. Um and mmm one of the things that that, um those are useful for is, apart from the fact it explains things relatively simply, is that it's got exercises and answers to the exercises and so on which you really need in order to um to make reasonably, reasonable progress. Cos when they don't look at that, all they're being given by me is a whole lot of exercises to do. They come for a tutorial and sometimes if they haven't gone through things with answers then they just are making all the same mistakes over and over again and so they have one opportunity to

TEA-LEC
TEA-TUT

PERC-LEA

INNOV-PROJ

TEA-AS
SYST-AS
PERC-SF
PREC-DEP
PERC-MOT-PED

be corrected um whereas using um exercises that aren't sort of explanations and so on means that one can spend more of the tutorial looking at things they really found difficult rather than correcting all the simple mistakes they've made from the word go. Um so, so, that, that's um, I mean of course they wouldn't have to be available online for that it's the sort of thing that logic textbooks are likely to have, often have questions and answers and so on. It just happens that that's a very convenient way for people to access them. No one of the things, of course, that logic programme does have is um the um things so they can actually do the full proofs and it checks when they make mistakes doing that which is something you can't get out of a logic book. I mean there won't be someone rapping your knuckles and saying "no you've misapplied that rule" and "that's a mistake" and so on. That's definitely um, and that also means that I don't have to spend so much, long, so much time going over their proofs and saying "No, you've made a mistake in line 4, no you've made a mistake in line 5" which is quite time-consuming, seeing where they've made mistakes, whereas instead a computer's doing it. Giving them nice error messages.

PERC-MOT-PED

INTERVIEWER [laughs] Um, so what do you do in the lectures?

LECTURER A Mmm, well, gosh I don't know how to answer that really. [pause] Well, I just do the, ok, I'm not sure if this is answering your questions. I mean I do the sort of thing that would be done in a logic book except I do it more slowly er and um, um, [pause] um it's quite low tech I have to say, partly because of what's available and partly because of what I've learnt to use, so for the most part the only technical um stuff I use is overhead projectors, um which are simply a substitute for writing things up on blackboards which take a long time and the lecture rooms don't have any longer, big lecture rooms in the arts, don't have big blackboards that you can write on. Um for the M&P and P&P things, I do those lectures up in the physics labs and they have proper blackboards that you can write on which are interactive things. The trouble about um overhead projecting stuff is it's not interactive, and it just goes up there. And what I ought to be using, um, for some of the purposes, particularly for the big PPE lectures there are about 300 people initially at it, and at the moment the only way of making the stuff visible is having two independent overhead screens with overhead projectors showing the same stuff. And I have to run around putting stuff up and of course you can't, er do anything dynamically on it. What of course one ought to have is a single PC, er with two data projectors on, and then I could use something like powerpoint of whatever so that at least there's a degree of, you know, one could go, for most part having anything dynamic doesn't matter too much, but when one is demonstrating how to do a formal proof, it's very helpful if you can have, if they can see it appearing line by line, rather than having it up there and saying, "no, just, you know, look at line 4, now look at line 5, now look at line 6." Some of them might appreciate it too but I, but, but, why, why don't I? Because um examination schools say data projectors are expensive and we haven't got enough.

TEA-LEC

TEA-TF

SYST-PRES

PERC-BAR-INFRA