The undergraduate experience of blended e-learning: a review of UK literature and practice

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Executive summary

The review of blended e-learning was undertaken by the Oxford Centre for Staff and Learning Development at Oxford Brookes University for the Higher Education Academy. The aim was to review existing research and practice on blended e-learning, identify key studies and issues, and make recommendations to guide future policy, practice and research.

Methodology

A key aim was to ensure that the review findings would be grounded in practice and relevant to the needs of the Academy's audience. Consistent with this aim, we adopted a methodology that combined traditional desk research with institutional visits and interviews with key personnel.

The review of over 300 studies of blended learning aimed to reveal methodologically sound evidence of the impact of blended learning on the student experience. We used a best evidence synthesis to identify the key papers with the aim of creating a manageable knowledge base for the synthesis. The following inclusion criteria were used in the selection of key studies: published since 2000, scenarios which blend technology with face to face teaching, experiences of undergraduates, representative of UK learning environments, clear rationales and/or objectives, embedded, evaluation of the learner's experience, justified and rigorous evaluation methodology.

The institutional visits and interviews aimed to give access to unpublished literature and to reveal practices that we could not know about as 'outsiders'. Interviews were conducted with seven institutions with reputations as long standing implementers of blended e-learning. The group represented a range of institutions including post-92 universities, research-intensive universities, and institutions with a sharp metropolitan focus or those serving a broader, regional area. We identified five attributes that were part of the blended learning agenda for some institutions: widening participation, enhancing learning, flexibility of provision, prominent e-learning early adopters, and computer aided assessment as a dominant feature.

What is blended learning?

Throughout this review we have been keen to find evidence of how the potential offered by technology is actually being interpreted and used by institutions, their staff and their students. We avoided reaching our own definition, noting instead eight dimensions implicit in the definitions we found: delivery, technology, chronology, locus, roles, pedagogy, focus and direction.

From the institutional visits and the review of course evaluations, we observed that there were three ways in which the term 'blended learning' was being used. Currently the most common type of blended learning is the provision of supplementary resources for courses that are conducted along predominantly along traditional lines through an institutionally supported virtual learning environment. Second, we found some, but far fewer, impressive examples of transformative course level practices underpinned by radical course designs. These often make use of technology to facilitate interaction and communication and replace other modes of teaching and learning. Third, we are aware of students taking a holistic view of the interaction of

technology and their learning, including the use of their own technologies, although this is currently under reported and under researched in higher education.

What underlying rationales are being used for promoting blended e-learning?

Institutional rationales for blended e-learning were highly contextualised and specific to each institution. They included: flexibility of provision, supporting diversity, enhancing the campus experience, operating in a global context and efficiency.

A few course level rationales related to institutional strategy, particularly offering flexibility in time and place of learning. However, most rationales at this level were in response to practical challenges being faced by staff and/or in response to student feedback (loss of staff-student contact, large classes, inconsistency in quality and quantity of feedback between markers) as well as responding to the demands of professional bodies in vocational courses. The rationale reported most frequently by local implementations was maintaining quality in response to increasing cohort sizes.

What monitoring and evaluation strategies are being adopted for ensuring and enhancing the quality of blended e-learning?

All seven institutions we visited described current plans for initiating institutional monitoring and evaluation strategies to assess their students' experiences. All were finding establishing institutional level practices problematic. We suggest this was due to the pressure to implement rather than evaluate, the low status of pedagogic research, and poorly defined measures of institutional success in embedding blended e-learning. All institutions welcomed the opportunity to share approaches both through this review and the Academy's Benchmarking e-Learning project. In response to the requests for support around evaluation, we have taken the opportunity to highlight examples of suitable approaches and techniques and make recommendations for those wanting to undertake their own evaluations.

Despite the difficulties around establishing institutional level monitoring and evaluation strategies, we identified and described a number of effective practices in various levels of operation in universities: regular module evaluations being used to inform departmental action plans, triangulated evaluations of students VLE use and institutional support for the collection and dissemination of case studies. We also suggested the promotion of pedagogic research both within institutions and for assessing the impact of course redesigns and drew on the pedagogic literature to make recommendations about conducting such research, concerning triangulation of data, collection of rich data and planning longitudinal and ethnographic studies. Finally, we noted the importance of making use of the findings of evaluations in course planning and redesign and noted examples where this had been achieved.

What impact is blended e-learning having on the student experience?

We find that student response is overwhelmingly positive to the provision of online course information to supplement traditional teaching. Students make regular and frequent use of electronic resources with few reported problems of access. They

particularly value flexible access both from home and on-campus. The impact of the provision of course notes is discussed in relation to support for students with disabilities and the possible impact on attendance. Students are concerned about the costs associated with downloading and printing and are critical of inconsistent use between staff and modules.

We find from evaluations of redesigned courses, that while students recognise the value in the blend of face to face and technology supported activities, there are large individual differences in how they experience the blend. It seems to be important that students understand the role of technology in their learning and the implications for their study strategies and engagement in learning activities.

There is an increasing recognition that students are making use of their own technology as well as those provided for them and that they are doing this in ways that are not planned for, difficult to predict and may not be immediately visible to their teachers and researchers. Taking a holistic view requires an understanding of the individual. We found that where there is a significant individual difference such as disability or culture, this dominates the experience for the individual, although not in ways that are stable or predictable. Others individual differences which seem to be important are prior experience and attitudes towards using computers within learning.

What are the success factors for blended e-learning?

Drawing out themes emerging throughout the previous sections of the review, we make the following recommendations for successful blended e-learning in practice:

- *Use the term blended learning*. Although difficult to define, the term 'blended learning' is finding acceptance among higher education staff. We suggest that the advantages of the term include its poor definition - which allows staff to negotiate their own meaning - the implication of the protection of face to face teaching, and the implication of designing for active learning.
- *Work with and within your context*. We found that institutions who we had identified as successful implementers of blended e-learning had highly contextualised and specific rationales for their adoption of technology. Similarly, successful local implementations were often in response to a real relevant issues occurring at the course level.
- *Use blended learning as a driver for transformative course redesign*. The importance of transformative course level designs was identified as one of three characterisations of blended e-learning. Throughout the review, staff repeatedly identified engaging in course redesign as critical to their success. The valuable features of the course redesign were identified as: undertaking an analysis of the current course, collecting and making use of student feedback, undertaking the design as a team, designs which make explicit their underlying principles, and developing the course iteratively over a number of years.
- *Help students develop their conceptions of the learning process*. It seems to be important how students conceive of their engagement with the learning processes and activities within a blended e-learning context. In order to support students, it is vital that we are consistent and transparent in communicating our expectations about, for instance, attendance patterns or how to engage in purposeful dialogue in asynchronous discussions.

- *Disseminate and communicate results of evaluations*. The need to co-ordinate, promote and disseminate results from evaluations was identified as a crucial aspect of monitoring institutional strategies and course redesigns.

Contents

1 Introduction

1.1 Overview

This review of e-blended learning has been undertaken by the Oxford Centre for Staff and Learning Development (OCSLD) for the Higher Education Academy. The aim was to review existing research and practice on blended e-learning, identify key studies and issues, and make recommendations to guide future policy, practice and research. We were keen to ensure that the review findings would be grounded in practice and relevant to the needs of the Academy's audience. Consistent with these aims we adopted a methodology that combined traditional desk research with institutional visits. This methodology allows us to describe how the national e-learning agenda and research findings are being interpreted by institutions and their staff and to analyse the impact for their students.

1.2 Aims

Recent years have seen a dramatic increase in both the uptake of e-learning within higher education and research into its impact for institutions, practitioners and students. We are now at a point where 95% higher education institutions are operating at least one virtual learning environment (JISC, 2005a). Browne and Jenkins (2003) reported that the use of VLEs was predominantly supplementary to face to face teaching. It is this blend of e-learning and face to face teaching which is becoming increasingly prevalent (the nature of the blend is further explored in Chapter 2). In the UK, in response to input from across the post-16 education sector, the HEFCE Strategy for e-Learning supports and codifies the prevalence of face to face teaching blended with e-learning (HEFCE, 2005). Blended learning is rising in the UK and is being predicted to rise further in reviews of practice in North America (Bonk, Kim and Zeng, 2006) and Australia (Eklund, Kay and Lynch, 2003).

In light of such an expansion of e-learning and the predicted future rise when used in combination with face to face teaching, there are already attempts underway to review the existing research. There have been reviews of e-learning in disciplines such as language learning (Chapelle, 2004; Felix, 2005) and technologies including e-portfolios (Beetham, 2005a), computer aided assessment (Conole and Warburton, 2005) and interactive whiteboards (Smith, Higgins et al., 2005) which make recommendations for the use in these specifics contexts and propose areas for further investigation. There is a need for a review which is more wide ranging than these concerned with specific technologies.

Such wide ranging reviews of e-learning have taken place in other sectors of education. Higgins (2003) undertook a systematic review of ICT in schools for the British Educational Research Association. He reports that while ICT can improve learning (through increasing time on task, providing feedback, demonstrating complex processes visually and prompting discussion in class), it can also be used inappropriately. Higgins concludes that it is *how* ICT is used that makes the difference and this is largely dependent on the actions of the teacher in how they select and organise resources and integrate them into their teaching. This is perhaps an unsurprising finding but it is interesting in terms of developing aims for the current review. There appears to be little value in another review which asks 'do blended approaches improve learning?' and which will predictably give an answer 'it depends'. Our review questions are more open, asking, for example, what is the impact of blended learning for students? Second, if impact is so dependent on the

individual teacher, it raises the question of the potential for difference between what is being reported in the educational literature and what is actually happening within schools, colleges and universities. The current review aims to present data from the literature alongside that from unpublished and internal sources which accurately represent current practice.

Reviewing studies of practice raises questions about how the research has been conducted. In reviews of the e-learning literature in USA (Sunal et al., 2003) and Australia (Eklund et al., 2003) both reported that most research is case study based. Eklund et al note the frequent use of action research by researcher/ practitioners, which improves local practice, but as a methodology, is difficult to draw more general conclusions from. This review will identify evaluative studies which have used methodologies from which we are able to generalise and disseminate their findings. In addition, in order to promote evidence-informed practice, the review will promote the use of rigorous evaluative practices.

A final aim arising from previous reviews concerns the rationales for adopting blended learning. While there has been widespread publication of the *potential* benefits of e-learning, and more recently, blended learning, it is not yet clear how practitioners and their institutions are choosing to make use of these approaches. In a review of North American practices, Curt Bonk offered the review team 40 possible problems (e.g. student absenteeism, lack of facilities) and their blended learning solutions, but we don't yet know which of these 40 reasons practitioners in the UK are using (Bonk, 2006). We would hope that alongside such practical issues our understanding of how students learn informs our choices. However, Cullen et al. (2002) in a review of pedagogic research for the Economic and Social Research Council have been critical of the use of theory to inform pedagogic practices finding that examples of good practice "Are either grounded in the day to day minutiae of 'chalkface' learning delivery (and hence ungrounded in theory) or, conversely, are tied to a particular 'grand learning theory' and are unsubstantiated in practice." (p. 73). The current review will attempt to identify practical and educational rationales used by practitioners to underpin their choices around blended learning in practice.

Institutional rationales are also of interest. In a JISC commissioned survey of virtual learning environment (VLE) use within 212 higher education institutions (HEIs), it was found that uses of VLEs which are expected to impact on student learning, such as communication, discussion and assessment were the most frequent reason given as to why HEIs are adopting VLEs (JISC, 2005a). However, using institutional case studies, Bricheno, Higgison and Weedon (2004) found that these uses are actually much less common in practice. We note this contradiction between aspiration and practice and will use the visits to explore this further.

1.3 Methodology

We adopted a pragmatic approach for this study, after Tashakkori and Teddlie (1998), where the research questions and study aims determine the methods used. The review of the published, peer reviewed research on blended e-learning was intended to reveal rationales for adopting blended e-learning and a selection of key studies would provide evidence of the impact of blended e-learning on the student experience. We also purposively sampled institutions to visit on the basis of their reputation for blended e-learning and used the visit/interview methodology to both record the published institutional policies and strategies and go beneath them to explore how they are being understood, articulated and implemented by their staff.

The following research questions were derived from the aims to guide the review:

a) How is the term 'blended learning' being used in higher education?
b) What are the underlying rationales being used for blended e-learning?
c) What monitoring and evaluation strategies are being adopted for ensuring and enhancing the quality of blended e-learning?
d) What impact is blended e-learning having on the student experience?
e) What are the success factors for blended e-learning?

1.4 Literature search strategy

We first established a plan for the search (Hart, 1998) by selecting a set of databases and journals to search and developing a set of search terms.

The following databases were searched:

- British Education Index
- Australian Education Index
- ERIC
- British Nursing Index
- Education Online
- Google & Google Scholar.

The following terms were used in combination in the database searches:

Core terms	**specifiers**
ICT	+ pedagogy
C&IT	+ student experience
Educational technology	+ learner experience
E-learning / eLearning	+ evaluation
Blended learning	
Mixed mode learning	
Hybrid models of learning	
Virtual learning environment	

In addition, the following publications were hand searched for relevant articles:

- ALT-J, Research in Learning Technology
- American Journal of Distance Education
- British Journal of Educational Technology

- Computers and Education
- Educational Media International
- Educause Quarterly
- E-learning and education
- Electronic Journal of e-Learning
- Innovations in Education and Teaching International
- Internet and Higher Education
- Journal of Computer Assisted Learning
- Networked Learning Conference Proceedings
- Teaching in Higher Education
- Studies in Higher Education.

We put out calls on the Heads of e-Learning Forum and Joint Information Systems Committee (JISC) e-Learning and Pedagogy Experts email distribution lists asking for suggestions for articles to include. We used our personal contacts to access unpublished literature. We also received submissions of papers in response to the project website.

Finally, we used some of the funding for Curtis Bonk to visit us while he was in the UK and provide an overview of the North American literature and practice on blended learning.

1.5 Database entry

This search strategy produced more than 300 publications. Each one was entered into an Endnote database with the following fields:

- Type (Journal article, Book, Book section, Conference proceedings, Edited Book, Report pr Electronic source)
- Author
- Date
- Title
- Source (e.g. for a Journal Article, journal name, volume, issue and pages)
- Abstract
- Notes (reader's own summary of the important points about the document)
- Label (institution name, public/private, country, language, type of evidence)
- Keywords (see below)
- Research notes (note here if this is a 'key paper')
- URL
- Link to PDF.

A set of keywords was founded on the five basic research questions (see Appendix 1) with subcategories and descriptors built up as we included more documents in the database. These keywords enabled us to search the database for the relevant literature on each research question and within each subcategory.

1.6 Identification of key papers

In the bid we proposed that rather than aiming for a very comprehensive review, a valuable function of this review would be to *make visible* existing research, policy and

practice which has transformed the student experience, been embedded over a number of years, and been thoroughly evaluated.

We used a best evidence synthesis to identify the key papers with the aim of creating a manageable knowledge base for the synthesis (after Slavin, 1986). Slavin recommends that reviewers apply consistent, well justified, and clearly stated a priori inclusion criteria. We used the research questions and early searches as a starting point to identify the inclusion criteria and developed them as the review progressed.

The following inclusion criteria were used in the selection of key studies:

a) ***Publications since 2000***
From the relentless e-mail, to student and staff portals, to virtual learning environments (VLEs) and computer aided assessment, daily practice in 2006 is quite different from how it was even five years ago. The uptake of VLEs by HEIs has been undertaken in a short period from 7% of HEIs in 1997, 81% in 2001, 86% in 2003 and 95% in 2005 (Armitage, Brown and Jenkins, 2001; Browne and Jenkins, 2003; JISC 2005a). This period has also seen the shift in use of technologies supporting distance learning to supporting face to face teaching. Technologies change quickly and teachers are constantly experimenting with their use. As the review aimed to be representative of the UK undergraduate experience, we favoured those studies which drew on recent data and excluded those drawing on data prior to 2000.

b) ***Scenarios which blend technology with face to face teaching***
Our remit was to describe the experiences of students in blended learning situations in on-campus universities. We excluded the large literature of using technologies to support distance learning.

c) ***Scenarios from undergraduate experiences***
A good deal of the current advice on e-learning has stemmed from research conducted with postgraduate and/or professional development courses (notably Salmon 2002, 2004; McConnell, 2000, 2005). Such participants are likely to be reflective, articulate, interested and informed about teaching and learning processes. As we worked towards an appreciation of the importance of students understanding their own learning as a possible success factor, it became important to distinguish between undergraduate and postgraduate learners.

d) ***Scenarios which are representative of UK learning environments***
We have drawn mainly on research from the UK. Where this is lacking, we have used research from other countries with similar teaching and learning environments and processes, and we have indicated where they are from.

e) ***Applications with clear rationales and/or objectives***
At the institutional level, this might be strategic developments or institutional level frameworks for supporting blended e-learning. At the course level, applications should have a clear and explicit rationale and/or pedagogical framework that aims to transform the student experience.

f) ***Applications that are, or are becoming, embedded***
Many studies of the use of technology are reports on innovative approaches that are frequently led by an enthusiastic teacher. Hughes and Daykin (2002) noted that many studies of students perceptions of e-learning had been carried out by skilled and enthusiastic lecturers with small groups of volunteer students and ‘a

lecturer's enthusiasm for online delivery may have created a form of Hawthorne effect, where students' evaluations may have been affected by this enthusiasm rather than the delivery.' (p. 217).

In a historical comparison of the literature on electronic voting systems pre and post 2002, Simpson and Martin (forthcoming) note that more recent papers which examine established course developments where existing practice is being refined and enhanced, are likely to be of more use in helping us understand the impact of technology than common problems associated with first use. We found that studies of first uses of technology frequently report issues which have already been well established e.g. encouraging uptake of computer aided assessments through some summative assessment (Enjelvin, 2005), the need for preparation and induction for the use of electronic materials (Davies et al., 2005), the distribution of handsets for electronic voting systems (Reay et al., 2005).

g) ***Evaluations of the learner's experience***
We have included work which identifies what makes a difference to the student learning experience or leads to a better understanding of what influences it. The student view is important to represent because it presents an alternative, sometimes contradictory, view to the tutors' views. For example Timmis et al (2004a) in an evaluation of a blended learning scenario observe that 'In general, the tutor's views of how students were communicating through the VLE was positive and collaborative. They reported that students were sharing teaching strategies and that they were able to encourage deeper thinking in the discussion board' (p.7). The interviews with students did not reflect this view. Students saw the discussion board as a forum for maintaining communication when they were on their placements.

h) ***Evaluations with a justified and rigorous methodology***
While we acknowledge the role of descriptions of practice in changing teacher's practice, we are interested here in making recommendations for evidence-informed practice. We have used anecdotes and quotes from learners where ever we have found them. However, our common themes and recommendations stem from studies which are thorough in their evaluation methodology. This includes piloting data collection techniques, ensuring that samples are sufficiently representative or purposively sampled, that claims for difference are supported statistically, that qualitative data are analysed methodically. We favoured evaluations that were triangulated i.e. that made use of data from a variety of times, methods and sources.

Each database entry was assessed against the inclusion criteria (see Appendix 2 for example). The application of the inclusion criteria produced a limited set of key papers which were given priority in the synthesis of the following chapters.

1.7 Institutional visits

The peer reviewed literature could only provide part of the picture. Additional evidence of practice is available at institutional web sites, often including institutional strategies and case studies of good practice. Such 'front of stage' documents can offer templates and examples of practice for other practitioners to use or adapt to their own needs. They often lack the historical and contextual information necessary for deciding what might be effective practice or transferable to other contexts. They also tend to be sanitised for public consumption. The valuable 'back stage' or 'under

stage' histories of successes, failures and conflicts relating to institutional practices largely resides behind institutional firewalls, inside intranets and in the collective social memories of the communities of practice that brought them into being (Lave and Wenger, 1991; Wenger, 1998). To gain access to such material we selected a small number of institutions for visits and interviews.

The visits aimed to collect internal documents such as e-learning strategies, institutional learning, teaching and assessment strategies, evidence of internal evaluations of blended learning, and examples of internal quality assurance procedures. Each visit involved a discussion with representatives of e-learning within the institutions. These interviews aimed to give the institutional representatives an opportunity to explain to us some of the thinking and history behind their institution's public policies and practices, and to reveal practices that we could not know about as 'outsiders'.

1.8 The process of selecting institutions

Given that the scope of the project would enable a maximum of eight institutional visits, our sampling strategy was to gather a variety of illustrative examples of interest to the sector, rather than representative of it. Since it is generally preferable to learn from experience of success, our first selection criterion was that the visit institutions should be perceived within the sector as a relatively long standing and successful implementers of blended learning. In addition, we aimed to represent a range of institutions including post-92 universities, research-intensive universities, institutions with a sharp metropolitan focus or those serving a broader, regional area.

Having conducted an initial scan of the strategies of a list of long-standing implementers of blended learning we identified five attributes that were part of the blended learning agenda for some institutions:

1. Widening participation
2. Enhancing learning
3. Flexibility of provision
4. Prominent e-learning early adopters
5. Computer-aided assessment as a dominant feature

Our list of possible candidates for visits was too long so the final criterion was an exclusion one: several institutions were not selected because there was already sufficient material about their experience in the public domain.

Based on these selection criteria, we took a shortlist of 22 institutions to the project steering group and shortly after this agreed on eight institutions we wanted to visit. Having conducted such a thorough selection process, we were disappointed to only be able to arrange visits to four of these. The other three interview sites were chosen from those who approached us to get involved in order to balance our final sample. Table 1.1 shows the institutional attributes represented in the group interviewed and the alias adopted for each institution.

Table 1.1 Institutional visit criteria

Institution	1st Attribute	2nd Attribute	3rd Attribute
Blackwater	Regional/local focus	Related to flexibility	Enhancing learning
Deepshire	Old U/Research intensive	Enhancing learning	Regional/local focus
Eastonhall	Regional/local focus	Old U/Research intensive	Widening participation
Kilderhill	Enhancing learning	Regional/local focus	Related to flexibility
Longside	Prominence in sector	Enhancing learning	Regional/local focus
Metroville	Widening participation	CAA	Regional/local focus
Westington	Widening participation	Regional/local focus	Prominence in sector

1.9 Interviews

Because our methodology involved site visits and interviews, in accordance with good practice we subjected our plan to ethics review and gained Oxford Brookes University Ethics Committee approval. Guaranteeing confidentiality of the data is the best way to minimise any risk to participants due to their remarks being identified publicly (Bogdan and Biklen 1982). To encourage participants to speak more freely to us than they might be able to do as public representatives of their institutions we informed all invitees that we would de-identify all the data we collected from our visits by default, using institutional and individual aliases for public reporting. We nevertheless wanted to offer everyone involved the fullest measure of informed participation that we could afford them, so pre-publication draft reports were distributed to participants who were offered the opportunity to be identified in the final, published reports if they wished.

Two members of the research team attended each institutional visit, except on one occasion when this was not possible and only one attended. We invited each institution to send at least two representatives to meet with us on each visit, recommending ideally the inclusion of a senior manager responsible for e-learning at a strategic level and someone with an institutional implementation role, such as an educational developer or faculty e-learning champion.

It cannot be inferred that the views of the participants in these visits are in some way representative of their institutions as a whole. Each participant gave their views from their own perspective. They recognised that others within their institutions might have a different view of the matters we discussed. Indeed, most of our visits were typified by high levels of unanimity punctuated by the occasional lively, collegial debate.

Table 1.2 shows the roles of the institutional representatives who met with us on each visit. All included representation at a senior planning level (a Head of e-

Learning or equivalent or a Head of Teaching Quality Enhancement). One institution sent just one representative due to an unexpected crisis that needed to be attended to by the Head of Learning Technology, who had planned to be there. One of the visits was conducted by videoconference and documents were exchanged by email.

Table 1.2 Institutional representation at visits

Institution	Institutional role 1	Institutional role 2	Institutional role 3	Institutional role 4
Blackwater	Head of e-learning or equiv	Educational developer	NA	NA
Deepshire	Head of e-learning or equiv	Educational developer	NA	NA
Eastonhall	Head of Teaching Quality Enhancement	Educational developer	NA	NA
Kilderhill	Head of e-learning or equiv	Head of Learning Technology	NA	NA
Longside	Head of e-learning or equiv	Head of Learning Technology	Educational developer	Faculty champion
Metroville	Head of Teaching Quality Enhancement	NA	NA	NA
Westington	Head of e-learning or equiv	Faculty champion	NA	NA

Piloting of interview schedules contributes to rigour (Cohen et al., 2000). We conducted a first visit with the University of Westington where we piloted a semi-structured interview schedule based on our five research questions. After evaluating the effectiveness of the interview items there, we made some minor changes to the interview schedule. This was distributed to each institution before the visit so that they could prepare for the discussion (See Appendix 3). Each interview was audio recorded and transcribed. The transcripts were subsequently reviewed against the recorded interview by a member of the research team, who made corrections as necessary. To ensure accuracy and enable each participant to give informed consent throughout the project, corrected transcripts were returned to participants so that they could make corrections, or indeed deletions if they wished any remarks to be 'off the record'.

The transcripts were coded using the NVivo© qualitative data analysis software. To ensure that the interview data could supplement the literature search, the coding system we adopted was to apply the keywords that categorised the entries in our literature search database. Thus, the first level of coding categorised utterances relevant to one or the other of the five research questions. Then, second and third

level subcategories were used to describe the aspect of the research question that was being addressed. As should be expected given the nature of this data, several new sub-categories were created to code utterances covering elements that had not emerged in the literature search.

1.10 Reflections on the process

The searching of the literature revealed over 300 relevant papers published since 2000, of which only 14 were finally adopted as 'key papers'. In terms of our a priori inclusion criteria, we noted that most papers were rejected because they were reports on innovations in their first year of operation and we make recommendations later in this report about the need for longitudinal research (see Chapter 4). We were reassured to find many well elaborated and clear rationales for blended learning presented by practitioners in the literature and discuss these in Chapter 3.

Arranging and conducting the interviews has been very time consuming. We do think it was worthwhile in that each visit has yielded internal documents - primarily e-learning strategies, learning and teaching strategies or internal evaluations of e-learning - that are not available publicly available. In addition, we found that the transcribed and processed data arising from the interviews provided us with an expansive and rich dataset concerning institutional processes aimed at embedding of blended learning. The data has required significant analysis and interpretation which is ongoing.

2 Definitions and uses of blended learning

2.1 Overview

The first research question this project aimed to investigate was how the term 'blended learning' is being used in higher education. The literature review demonstrated the difficulty that others have had in reaching a consensus around a definition. We noted from the interviews that some institutions have developed their own language, definitions or typologies to describe their blended practices. We suggest that this poor definition may be a strength and part of the reason why the term is being accepted. The lack of definition allows institutions to adapt and use the term as they see fit, and to develop ownership of it.

Rather than offer another insufficient definition, we synthesised eight dimensions that embrace the possibilities of blended learning:

- delivery different modes (face-to-face and distance education)
- technology mixtures of (web based) technologies
- chronology synchronous and a-synchronous interventions
- locus practice-based vs. class-room based learning
- roles multi-disciplinary or professional groupings
- pedagogy different pedagogical approaches
- focus acknowledging different aims
- direction instructor-directed vs. autonomous or learner-directed learning.

Moving from blended learning to our focus for this review of blended e-learning, we were keen to find evidence of how the potential offered by technology is actually being interpreted and used by institutions and their staff. Drawing together the data from the institutional visits and the database of publications, we observed three broad characterisations for blended e-learning as it is practised today:

- The provision of supplementary resources for learning programmes that are conducted along predominantly traditional lines, through institutionally supported virtual learning environments.
- Transformative course level practices underpinned by radical course designs which often make significant use of technology to replace other modes of teaching and learning.
- A holistic view of technology and learning, including the use of the learners' own technologies to support their learning.

2.2 Use of the term 'blended learning'

> To date, the differences and similarities between online, traditional distance and physical-based teaching have been little understood, leading to confused notions of the panacea of "blend". (Salmon, 2005, p. 202)

In our own experience we observe that the term blended learning has been in use for more than 15 years but that its meaning has been constantly changing during this period. In the late 1980s the Workers Education Association (WEA), Ruskin College and the Open University collaborated on what was called a blended learning programme for adults, without qualifications, returning to education (Moore and Bryant, 1989). The programme blended evening/weekend courses with residential

learning sessions and distance learning support. The general discussion around course development at the Open University at the time used the term ‘blended learning’ to signify a mix of distance and face-to-face learning. Summer schools and monthly tutorial-group meetings were typical face to face interventions in a predominantly distance learning mix. Through the 1990s the corporate training world spoke of blended learning as enhancements to the typical corporate training intervention: the short course.

> Corporate researchers and practitioners noted that technology enhanced learning alone was not enough, arguing that people needed experiential learning for the mastery and retention of knowledge and skills achieved through the blending of technology and face-to-face interaction. (Matheos et al., 2005)

Short courses were blended with pre-course readings and post course activities such as action-learning sets and project-based learning teams to embed the learning in the workplace (Roberts et al., 1996). Short course participants also received electronic materials (e.g. spreadsheet-based project finance models, trading simulations, technical process modelling, etc.), on portable media, initially floppy disk and later CD and eventually through web services. At the turn of the century web-based distance learning and training was being blended back with supplementary printed manuals and optional face to face seminars ‘at a location near you’. So, when commentators today say, for example, ‘One of the next new terms to dazzle us in technology enhanced education is ‘blended learning’’ (Smith, 2001) we can read it with a strong sense of deja vu.

Even today, the term seems to retain both novelty and usefulness, with the University of Hertfordshire awarded a Centre for Excellence in Teaching and Learning for its Blended Learning Unit.

It has been suggested that the term remains in use because it is ill defined. Driscoll (2002) concludes that it is this lack of definition, meaning different things to different people, which gives the term potential. We would agree that from our experiences at Oxford Brookes University, allowing staff to debate their interpretation of the term, helps them develop ownership of how it is used within the institution (Sharpe et al., 2006). Oliver and Trigwell (2005) draw different conclusions for the same observation of the ubiquity of term blended learning in higher education. They conclude that:

> By any definition there is little merit in keeping the term ‘blended learning’ as it is currently understood. It is either inconsistent (and so useless as a way of understanding practice) or redundant, because it simply describes practice within higher education more generally, and it attributes to learning something that, in terms of what we know, only applies to teaching or instruction. (Oliver and Trigwell, 2005, p.21)

Two of the institutions we visited similarly rejected the term as being an unhelpful buzzword that describes longstanding learning and teaching practice, e.g.:

> *My own personal and fairly strongly held view, and a view that's shared by at least some of the rest of the team, and is now being inflicted on the rest of the university, is that it's a catch-all word that really means nothing. A condition of teaching and learning in higher education now is that it is mediated electronically, in all kinds of ways and it's more important to understand the*

> *variety of ways in which that's happening than it is to have some sort of catch-all term.* (Blackwater 1)

Despite some concerns over poor definition and use of jargon, the term blended learning has become ubiquitous. Rothery observes that most standard practices in universities across Europe now involve a mixture of approaches (Rothery, 2004). While providers of face-to-face training enhanced their courses with online elements and preserve the values of the face-to-face experience, the providers of distance learning courses converged on a blended model from the other direction, offering optional printed manuals and supplementary face-to-face workshops.

Before we go on to look at what blended learning means to people, it is important to consider one final aspect of the use of the term. Through our study it becomes evident that there is something else at work, something that intrudes value-laden criteria into the discussion. Derntl and Motschnig-Pitrik (2005) capture one of the reasons the term is finding acceptance. In a climate of rapid change innovation fatigue can set in. The past ten years have seen some institutional learning and teaching practice impacted upon heavily by learning technology. However, as Derntl and Motschnig-Pitrik emphasise, *e-learning* is still too concerned with content delivery and transmissive models of learning. If e-learning is reified as unidirectional, transmissive, computer-based learning, then any *blend* is bound to find greater acceptance by academics, whether this is for moving away from transmissive models of teaching or for preserving 'pleasurable opportunities we have for face to face contact with our students' (Stubbs and Martin, 2003, p.8). Anything that admits dialogic or reflexive learning practice feels more acceptable, as seen in Metroville University's e-Learning Strategy:

> Curriculum design will incorporate e-Learning wherever it will most benefit learners, delivering flexible and distributed learning, accommodating a broad range of learning opportunities for students afforded by e-Learning technologies. While the University recognises the value of delivering passive content via the VLE, its intention is to focus increasingly on the provision of activity-based, independent learning using e-Learning technologies. The University acknowledges that this is likely to lead to a shift away from the traditional regular lecture-tutorial cycle with implications for estates and timetabling. Academic staff will take the lead in embedding e-Learning for delivering the curriculum. (Metroville e-Learning Strategy (2005 – 08) p.3)

Such value laden uses of terminology were apparent through our interviews where we observed the tension between front of the stage, public assertions of institutional policy and practice and the back-stage rumblings of dissent. In contrast to the front-of-stage documents, the back-stage discourse revealed in conversation is far more complex and less harmonious, "*I don't want to disagree with you, but…"* (Longside 4). There is evidence of conflict between the different actors involved in the practice of education.

> *I told our senior officer responsible and vice principal that personally I wasn't particularly happy about all this terminology. We've tried to remove as far as possible jargon throughout everything we're doing because we won't reach academics if we use too much jargon.* (Kilderhill 1)

In a recent review of the literature, Oliver and Trigwell (2005) identify three meanings for the term blended learning:

1. the integrated combination of traditional learning with web-based online approaches

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

3. the combination of a number of pedagogic approaches, irrespective of learning technology use

Oliver and Trigwell recommend that the term blended learning can be redeemed by focusing on the variation in the experience of the learner. Implicit in their argument is an approach that is not wholly instructor-led, but combines learner self-direction with traditional instruction. McShane (2005) adds a temporal dimension observing that learning technologies enable blending synchronous and asynchronous teaching and learning. Schrittesser (2004) adds another important dimension, that of blending an apprenticeship approach to learning with a reflexive approach to learning. Both McShane and Schrittesser characterise the blending of pedagogical approaches. Although we didn't find many examples of blending pedagogical approaches (see Chapter 3), it is along these axes that we see the potential of blended learning to emerge as a transformational practice. It is likely that it is this approach that is likely to be most productive in making the best use of blended learning. As Salmon says:

> E-learning is in a rather extraordinary position. It was bought as a 'tool' and now finds itself in the guise of a somewhat wobbly arrow of change. In practice, changing the way thousands of teachers teach, learners learn, innovation is promoted and sustainable change in traditional institutions is achieved across hundreds of different disciplines is a demanding endeavor that will not be achieved by learning technologies alone. It involves art, craft and science as well as technology. (Salmon, 2005, p.201)

2.3 Dimensions of blended learning: towards a meaning

This survey of the research literature has provided us with definitions that embrace the possibilities of blending along the following dimensions:

- Delivery - different modes (face-to-face and distance education)
- Technology - mixtures of (web based) technologies
- chronology - synchronous and a-synchronous interventions
- locus - 'authentic' work or practice-based vs. class-room based learning
- roles - multi-disciplinary or professional groupings of learners and teachers
- pedagogy - different pedagogical approaches
- focus - acknowledging different aims
- direction - instructor-directed vs. autonomous or learner-directed learning.

The first three items in the list, the blending of **delivery mode**, **technologies**, and **chronology** are consistent with the historical use of the term. Learning programmes have been blending distance and face-to-face modes using different technologies to allow flexible scheduling for years. These meanings are conveyed in the following institutional descriptions:

> *In our corporate plan the focus is on flexibility, so it's really flexible learning. Our corporate plan says it's a mix of face to face and distance. We are a predominately campus based university, with odd pockets of truly distance*

learning in various places. And we also have big franchised courses which are delivered at a distance but supported locally. (Eastonhall 1)

Online learning has now changed its meaning from what we meant in 1999, which was … supplemented work. Online learning now more means you're online and you might see somebody face to face. That wasn't anywhere near the way I'd expect it to be used six years ago. (Longside 2)

When the term is used to embrace these three aspects alone, there is little that is being done to affect business as usual. Learning and teaching remains predominantly traditional. This is not to be critical of blended learning practices that go no further. There is no suggestion that traditional practices will not produce effective and satisfying learning experiences for both teachers and students. Students appear to be overwhelmingly positive about access to online resources to supplement traditional teaching (see Chapter 5) but the roles are not challenged. The learner is subordinate to the learning, which is still institution and teacher centred. This is where we find the bulk of blended e-learning practice. The VLE is used as a repository for and a means of transmitting content. A certain amount of chronological flexibility is introduced, allowing learners to revisit items which may have been presented at times inconvenient to them. Discussions are released from the confines of the classroom and may be pursued through online forums. Teachers embrace such practices as a convenience which allows them to retain the pleasurable aspects of their jobs and to resist what they feel as commercial performative pressures to do ever more with fewer resources.

The next three items in our list, **locus**, **roles**, and **pedagogical approach** take blended learning further. In spite of Oliver's antipathy to corporate training, the commercial world has long held that authentic, work-based learning is highly valuable. This is not only for the efficiency of keeping people on the job while they learn, but because for many learners, authentic, practice-based settings are more effective learning environments than abstracted and more theoretical classroom-based settings.

What we're trying to do is to bring the real, broader world into the curriculum, so that students are trying to practise and develop their skills in as close to a real world context as possible. And we've got a number of projects which we're about to start which are about trying to create those sorts of environments across the university. (Metroville 1)

For example, learning technology has been used to support placement-based learners (McGugan and Peacock 2005; Allison, 2004). Authentic practice-based learning is increasingly used in medical education such as in the new Peninsula Medical School (PMS) which has adopted the principle of problem based learning as a core instructional strategy (PMS, 2005). Engineering subjects are also beginning to adopt problem-based learning where work placements, site visits and field work have always been valued (e.g. Manchester School of Engineering, 2004; University College London, 2002),.

One of the things that we tend to say when we go into departments … is that they're quite accustomed to blended learning anyway. In my case in Engineering we've been blending lectures with workshops, with tutorials, with laboratories, with site visits, and we've spent twenty years doing that. (Kilderhill 1)

> [The course] showed that one can teach even a rather conservative laboratory subject matter like programming in a new style. It does not depend on the subject, but only on attitudes. In the beginning I was convinced that this is only possible with diffuse subjects, but it turned out that instructors can even provide enough freedom (not only through self-chosen project topics) despite the exact nature of the requirements. (Derntl and Motschnig-Pitrik 2005)

Essential to this process is the provision of a study or learning landscape, which has been achieved through a commercial VLE (JISC, 2005a). As roles come into the blend we begin to see the possibility of breaking down the traditional discipline and practice-based divisions that characterise higher education. Cross-functional teams enable different strengths to be harnessed and the preserve of the traditional teacher is opened up to allow learning technologists and administrators to play a more active role in the design, development and facilitation of learning programmes.

> *Staff will have to think through much more critically in terms of course design how they link through the increasing range of resources that are out there with what goes on in the classroom setting.* (Metroville 1)

> *It's about blending the whole student support and curriculum areas together, ideally into one seamless whole.* (Metroville 1)

> *Initially blended learning was an extra line of support [in Health Care], it was more about cost effectiveness in the Business School, and with [one of our] national teaching fellows the approach was retention. So we had blended learning in different ways.* (Longside 4)

Teams may also allow the introduction of more than one pedagogical approach into the blend. Some learners may thrive in a didactic situation, may want to be given all the theory before they turn to practice, and may need or want the extrinsic motivation of summative assessment to produce their best work. Others might prefer a more active, problem-based approach to learning where theories are derived from or at least better assimilated in a practical context, and learn best from peer-to-peer formative assessment. In a blended course it might be possible for some learners to follow a collaborative learning strategy with like-minded colleagues while others pursue their studies as independent learners.

The last two terms in our list, **focus** and **direction** take the concept of blended learning even further. The dimension of focus acknowledges that learners' aims are at least as important as the aims that the institution might have in developing learning programmes and the dimension of direction allows that not only are the learners' aims equal in status to institutional aims but so too might the learner be (or become) an equal partner in the shaping of their own learning.

As learners arrive at university with ever increasing levels of sophistication in the use of technology they may be less inclined to be inscribed into institutional practices. It is in focus and direction that we see holistic practices beginning to be shaped, where any learner might learn through any (or no) device at any time in any place.

> *So students will have access to … what classes they are taking, examination marks, announcements, hopefully in the future through the VLE … access to discussion forums and files that are posted online and all the usual stuff, plus video, on any device, whether they're sitting on campus on a campus computer, or sitting at home on Broadband, or accessing it on the bus coming*

in the morning. There will be MP3 files to listen to lectures in French before they actually go to the lectures. (Kilderhill 1)

2.4 Three characterisations of blended e-learning

We have seen that the term blended learning is difficult to define, which may be its strength and rather than offer another definition we have suggested eight dimensions along which blended learning scenarios may vary. Using the review aims as a guide, we focused for the remainder of the review on scenarios which blend technology with face to face teaching as the mode being most representative of UK higher education. Within this still broad categorisation which we refer to as 'blended *e*-learning', we noted three types of use:

2.5 The provision of online supplementary resources

First, we identified the provision of supplementary resources for learning programmes that are conducted along predominantly traditional lines, predominantly through institutionally supported VLEs.

The most pervasive use of technology to be adopted by HEIs in the last decade is the VLE. Usage is also high and increasing within institutions (JISC, 2005a). A survey of Scottish HEIs found that between 50 and 90% of courses now make use of their institutional VLE (Ward, 2006). It is still a consistent finding that the most common uses of institutionally supported VLEs are to supplement on-campus studies and to do this by providing course information and access to web resources (Bricheno, Higgison and Weedon, 2004; JISC, 2005a; Ward, 2006). Britain and Liber called this 'content + support' (1999, p.9, drawing on Mason, 1998) and attributed it to the most commonly used VLEs affording transmissive rather than constructivist or collaborative pedagogies.

Many institutions recognise this characterisation. Eastonhall described it as '[the VLE] is just basically a filing cabinet' (Eastonhall 1) and noted that it was prevalent in the 'bedding in' phase of VLE implementation (see Chapter 4). The University of Glamorgan has called this 'e-teaching'

> where tutors teach in traditional ways through lectures and seminars, but provide extra support to the students by placing lecture notes on the web (Jones and Fitzgibbon, 2002, p.399).

University College Northampton calls this 'VLE-resourced' (Enjelvin, 2005). At Oxford Brookes, this is referred to as Mode 1 and defined as 'using the web to distribute course information and carry out course administration'. (Sharpe et al., 2006, p.139). It is interesting to note that many institutions have developed their own typologies of blended e-learning in response to its poor definition.

2.6 Transformative course level practices underpinned by radical course designs

Second, we found a smaller but growing set of practices which are fundamentally and radically transforming course designs. Evaluations of such courses have clear principles underlying the changes they have introduced. Here the emphasis shifts

away from the VLE to extensive use of other technologies that are available to enhance and perhaps even change how students study, interact and learn.

We suggest that course (re)design is a critical success factor and that transformation appears as much to result from applying principles of constructive alignment to the redesign as from the particular technological modalities of the new course that produces the transformations (Georgetown University, 2002; Hanley, 2002; Talay-Ongan, 2003; Zemsky and Massy, 2004). In particular, ensuring assessment strategies are constructively aligned with the learning objectives is important. For example, Stubbs et al., (2006) in Box 2.1 below, and Boyle et al., (2003) in Box 5.2 both aligned blended learning activities with the assessment in computing courses. Online materials included samples of code that could be assembled to form a working model like the ones the students had to build for their individual assessment. This alignment encouraged the use of the web materials. In the Boyle et al. example, the course design explicitly took a spiral approach where each topic was introduced early and revisited and elaborated on later.

Such an emphasis on design is probably not the norm for either traditional or blended courses. E-learning requires even more planning and exposes the lack of design usually in operation (Stiles and Yorke, 2003) and yet redesign becomes more difficult when some staff are adamant that pedagogy doesn't need changing (e.g. University of Westington Staff Survey, 2003) and want to use the technology to reinforce or supplement existing approaches. We have highlighted those implementations which have clear pedagogical principles underpinning their design of activities and assessment such as Biggs' (2003) principles of constructive alignment, or choice of technology appropriate to task (e.g. Laurillard's 1993 typology).

Box 2.1

Creating a coherent blended learning experience in the Business School at Manchester Metropolitan University

The Emerging Technologies and Issues first year module was redesigned to set students' expectations for university study. The course team used clear design principles to make explicit their intended outcomes and to inform the activities and assessment of the course.

One Design Principle was 'the tutor as expert of last resort'. This was designed in by allowing access to tutors only for those students who had engaged with the online environment. This was reinforced by showing usage data for online materials during the lectures. The students quickly grasped what was expected of them e.g. "Don't even bother asking – he knows you haven't had a go yet." Tutors noted that peer support groups formed and that tutorials were 'intense experiences' of non-trivial problems.

Another Design Principle was that students engaged regularly. It was felt that routine was important in establishing good study patterns in this first year course. The course team booked 10 hours of computer labs each week and scheduled students for one hour each, each week. A tutor was on hand for ½ hour with each session. This encouraged students to work on their assignments regularly.

Stubbs, Martin and Endlar (2006)

2.7 A holistic view of technology use to support learning

Third, some institutions were aware of a holistic view of technology and learning, including the use of the learners' own technologies (mobile phones, online communities, instant messaging, etc) to support their learning, sometimes in unexpected ways:

> *the general philosophy that our IT services has is in terms of more a managed learning environment than a virtual learning environment -- is any device, any place, any time, and we're trying to work towards that. … It's that sort of philosophy that we have, to recognize that the whole thing will be blended together, any device, any time, any place. (Kilderhill, 1)*

Data emerging from recent learner focused evaluations certainly supports this view. The JISC funded LEX project has interviewed 55 students from a range of post-16 contexts about their use of technology in support of their learning. They note that most learners do not distinguish between learning with or without technology and offer the following quote from one of the learners interviewed.

> "To me its just learning, the fact that it's online as opposed to in a classroom is irrelevant. It's just another way of accessing it. It's all just learning …. for me I just think of it as learning and I don't use the term [e-learning]." (Creanor et al., 2006a, p.5)

While this third characterisation of blended learning might be for the most part aspirational and inspirational rather than evident in institutional practice, our site visits and interviews with practitioners in institutions where blended learning might be considered to be embedded suggests that this holistic vision of a radically transformed higher education world is guiding their efforts.

3 Rationales for blended e-learning

3.1 Overview

The second research question was to identify the underlying rationales being used for blended learning. Building on the three broad characterizations of blended e-learning introduced in Chapter 2, we start with rationales for blended e-learning being used at the institutional level. In the interviews we explicitly asked staff to describe their institution's rationale for adopting blended learning (see Interview Schedule, Appendix 3). We found, as expected, that staff at each location were able to articulate their institutional rationale and in some cases, the drivers behind them. The themes expressed were: flexibility of provision, supporting diversity, enhancing the campus experience, operating in a global context and efficiency. To hear five different rationales from seven different institutions indicates a great deal of decision making being made in developing policy and practice. We noted that rationales were highly contextualised and specific to each institution and suggest this is a significant factor in the success of these institutions as long standing implementers of blended e-learning.

In the next section we summarise rationales reported by course evaluations of local implementations. We were encouraged to find that most evaluations were able to articulate their reasons for attempting a blended course redesign. A few related to institutional strategy, particularly offering flexibility in time and place of learning. Most were in response to practical challenges being faced by staff and/or in response to student feedback (loss of staff-student contact, large classes, inconsistency in quality and quantity of feedback between markers) as well as responding to the demands of professional bodies in vocational courses.

The rationale reported most frequently by local implementations was maintaining quality in response to increasing cohort sizes. The challenges of teaching large classes have been in the spotlight in higher education for some time so it is of interest that staff are now applying some of the new possibilities offered by blended e-learning to this problem. Blends to tackle teaching large groups included offering extension activities, creating more opportunities for feedback, structuring out of class time, preparing students for practical work, promoting interactivity in class, and creating opportunities for dialogue in small groups. Other course level rationales which were not directly related to large classes were bridging the theory-practice gap, developing computer literacy, and offering flexibility.

To understand blended e-learning holistically, it needs to be seen as part of learning, so here we highlight educational rationales for blended e-learning which most clearly express how they have been based on a particular approach to understanding student learning. In reviewing studies which had a clear and specific educational rationale, we used the framework provided by Mayes and de Freitas (2004) of associative, cognitive constructivist, social constructivist and situative learning theories.

3.2 Institutional rationales for blended learning

As explained in Chapter 1, the institutions visited were initially selected on the basis of their reputation as relatively long standing and successful implementers of blended learning. As well as prominence in the sector, the sample was constructed to

represent a variety of institutional agendas: a regional or metropolitan focus, research intensive, widening participation, enhancing learning and flexibility of study. The interviewees were asked to explain their rationales for adopting blended e-learning. The SURF (2005) review of institutional policy choices in universities in the Netherlands, found that choice of approach is determined by the social and historical context of the institution. Our results support this finding. The rationales expressed were, in no particular order: flexibility of provision, supporting diversity, enhancing the campus experience, operating in a global context, and efficiency.

3.3 Flexibility of provision

Eastonhall and Blackwater, both regional universities, stated their rationales as flexibility of provision, within the context of recruitment and retention. Staff at Eastonhall were explicit about their intention to provide opportunities for their students to work from home:

> *It's mainly flexibility of provision … Because student recruitment's an issue; and retention. We get a lot of students … who are working. So although they are nominally full time here they're actually part time. And we have a high percentage of ethnic minority students who live at home. I think this year was the first time our first year undergraduate recruitment was 53% from the local region.* (Eastonhall 1)

The context of these institutions as being in, belonging to, even serving a region, is important. In reading Eastonhall's e-strategy framework, there is an emphasis on flexibility of access with a strong campus focus. The intention is that this is achieved through the use of mobile and wireless technologies to improve access. There is a vision of placing the University at the centre of the city and region and of supporting home based learners within the region. In terms of how they are implementing this vision, Eastonhall gave the examples of large interdisciplinary nursing courses and the foundation engineering programme where flexibility is essential as students are on campus infrequently and at different times.

Blackwater has a long history of offering flexible learning opportunities to students in the region. The agenda is the same, and blended learning is being used as one of the ways to appeal to today's students, along with for example, keeping university facilities open for longer hours. In practical terms, the current e-learning strategy is integrated with the flexible learning agenda and has been approved by the flexible learning committee.

3.4 Supporting diversity

Metroville gave as a rationale for blended learning having to deal with a diverse student body with high proportions of mature students, home students from ethnic minorities and international students. The challenge for Metroville is to provide support systems which cater for their students' diverse needs:

> *Given that sort of student background, how do you provide a structure which can cater for individual needs? How do you provide individualised learning in the context of massification of higher education and a diverse student body? We see the blended approach as being one route in, because people ought to*

be able to find, if they've got the right skill set, to find a route through to finding their own support. (Metroville 1)

3.5 Enhancing the campus experience

Longside is now focusing on using technology to enhance existing teaching and learning practice. In their e-learning strategy, they state that:

> In its sustaining role it enables us to enhance and support what is already being done with existing technologies. For example we can add communication possibilities, distribute teaching materials more easily, track student performance in more detail and so on. Sustaining technologies have the ability to improve existing product and service offerings along the mainstream dimensions of performance that customers value
>
> (University of Longside e-Learning Strategy, 2005, p. 5)

Similarly Deepshire responded to interview questions about their rationale by referring to enhancing the existing experience of students and gave some examples of discipline based projects such as supporting nurses at geographically dispersed placements and using e-portfolios to help students manage the evidence created through practice placements.

Kilderhill also gave enhancement as their primary rationale. Here the focus is clearly on enhancing the experience of students while on campus. Kilderhill has done this explicitly through the development of classrooms in a city based campus which has little opportunity for physical expansion. They have designed technology rich classrooms for different teaching and learning activities e.g.

> *The first kind of classroom environment we built was what you would call an interactive classroom, which has group seating and electronic voting systems in it and all the other stuff you'd expect in a smart classroom. But a lot of that for example is to do with teaching styles, because it's all group work, it's all active collaborative learning, even in a large classroom.* (Kilderhill 1)

3.6 Operating in a global context

Both Metroville and Eastonhall referred to the wider context as an institution operating within a global context. Metroville did so in two ways. First, there is the notion of marketing courses globally. Both Metroville and Deepshire gave examples of new fully online distance programmes being developed to access small, global, niche markets.

> *First there is this notion that the rest of the sector is moving this way and you need to be there if you're going to market courses globally. Which is increasingly what you're doing; you need to be competitive, you need to be seen to be competitive. So there's that dimension to what we're trying to do.* (Metroville 1)

Second, Metroville see a future role in developing global citizens with e-literacy skills. To be competitive they consider that they need to produce graduates 'who are capable of functioning in an e-age':

> *We would expect our students to be able to have the skills to be able to find their route through to manage their own learning; to be able to work face to face, with what goes on in a classroom setting, however we define that, and also find support online and be able to engage online with the increasing range of resources that are out there.* (Metroville 1)

Eastonhall also expressed competitive advantage as a major driver in their e-strategy framework document 'If we don't provide and support facilities and resources such as these, other institutions will do so and we will inevitably lose market share.'

3.7 Efficiency

Although none of the interviewees gave financial savings as a primary rationale, there are clearly continuing pressures on higher education staff to work efficiently. Kilderhill had explored how adopting blended learning on a programme would impact on staff time. They talked of freeing up staff time, or at least making it more flexible:

> *We did a cost benefit analysis and if you do this, if you teach in studios, if you do active collaborative learning in class, if you properly blend in the online component of that, it can release staff members' time. Or to put it a different way, it allows them to have more control over the time. They don't have to turn up at a certain lecture theatre at nine o'clock every Friday morning, so they can manage their time in different ways.* (Kilderhill 1)

Longside described how early developments in the School of Business had been 'economically driven up to a point'. The school explored how they could

> *deploy the technology in a way to help us square the incessant pressure of the time, driven by HEFCE and others, of more and more students and fewer and fewer staff.* (Longside 1)

3.8 Course rationales for blended e-learning

In this phase of the review we were interested to see how the promotion of blended learning occurring nationally and internationally in educational circles, and being seen in some institutional strategies, is being interpreted by higher education staff who are making decisions about how best to teach their students.

Building on the findings from Chapter 2 of a broad characterisation of blended e-learning around transformative course level practices underpinned by radical course designs, we collected course evaluations both from the published literature and received a number of unpublished internal evaluations from our interviews, calls on email lists and the research team's professional networks. Given the rhetoric around technology and the criticism often repeated of implementing technology for technology's sake, we were reassured to easily find many course evaluations with clearly expressed rationales. As explained in Chapter 1, this review aims to be grounded in practice and to make visible good examples. Here we summarise the rationales being used and highlight some of those key studies which met our inclusion criteria.

3.9 Blended course designs for large group teaching

It was clear that higher education staff are developing a creative range of blended course designs to tackle problems created by large group sizes. For example, Dickinson (2005), in an internal review of an accountancy module at Newcastle Business School, noted that as the cohort size approached 600, weekly seminars had been dropped to fortnightly meetings. The course team then made use of the VLE to supplement the remaining class time, including the presentation of weekly discussion questions with discussion forums available and timed release of answers. The intention was to help students structure and pace their study between the seminars.

Other responses to teaching large groups have been developing learning objects for difficult topics (Boyle et al., 2003), offering extension activities for some students (Oliver, 2006), creating additional opportunities for feedback (Catley, 2004), preparing students for practical work (Davies et al., 2005), promoting interactivity in class (Boyle and Nicol, 2003), and creating opportunities for dialogue in small groups (Condron, 2001).

Box 3.1

Preparing for clinical placements in the Physiotherapy degree at the University of Birmingham.

The course was redesigned in response to an almost doubling of student numbers (from 48 to 88) over two years which led to difficulties giving students access to patients. To support the development of observational skills with limited access to patients, the neurology module has introduced video clips of patients in combination with traditional group based and practical classroom sessions. Over three successive years of course delivery the blend has been refined so that now the video clips are presented through WebCT and available on CD-ROM. Observational skills are assessed by multiple choice and short answers presented through WebCT.

The evaluations used an end of module questionnaire and focus groups to elicit student feedback. It is reported that 72% of the survey respondants thought that the use of computer based material had been useful in developing their observational skills and 83% thought their IT skills had improved as result. In focus groups, students identified the benefits of the video resources as visualisation (seeing real patients and their movements in a real clinical setting) and flexibility (having CD-ROMs to play at home or at the university in their own time). They raised concerns about the delivery of some of the summative assessment via computers, suggesting that those with who were not proficient in using computers or with slow typing speeds were disadvantaged.

The authors conclude that the project has added value to the students experiences by offering a ‘more student-centred, interactive, and flexible approach to learning whereby students were able to practise their skills frequently, in their own time, and in greater detail than they would have done by traditional methods alone where patient contact is limited.’ (p. 847-848).

Davies, Ramsay, Lindfield & Couperthwaite (2005)

3.10 Engaging students out of class

A second grouping is of those course evaluations which describe course designs aiming to support students during periods of little staff student contact. The reasons that students might not have easy access to staff are varied and location and discipline specific (and include large classes discussed previously).

Clouder and Deepwell (2004) report on the findings of an initial phase of an action research project where online discussion boards were provided for physiotherapy students while they were away from Coventry University on placements. Whilst on placement the students are expected to conduct critical incident analyses and write these up for inclusion in their portfolio. The discussion boards were created for students to share their incidents and experiences during the placement period which is often characterised by rapid personal and professional development. As in many other discussion based implementations, the students and the course team found the discussion more challenging than they had expected. The clear rationale remains of providing peer support and fostering reflective capabilities in these student healthcare professionals.

In quite a different kind of blend, Clarke et al., (2004) describe a small pilot study at the University of Oxford where there is often a long period of time without student – staff contact between the end of teaching and the exam period. This study created sets of multiple choice questions to supplement first year undergraduate management lectures. The aim was to provide additional ways for students to learn and judge their progress during such periods of low staff-student contact time.

Even without prolonged periods without contact with staff, some courses have aimed to better support and structure what students do outside of class time. Enjelvin (2005) reports on the how the French Department at the University of Northampton have been progressively developing their use of technology to provide interactive tasks for students to use outside of class time. This use was driven by student feedback from the normal quality assurance processes where students were requesting more opportunities for reinforcement activities that could provide immediate feedback. Over the years these have progressed from being entirely optional to forming part of the summative assessment. Students are expected to complete all the weekly tasks and the best five grades count towards the overall module result. A survey of student perceptions reported generally positive responses from students about the use of these interactive tasks. 74% of students agreed that the tasks are a good idea because they can spread their workload, 87% agreed that they were useful to follow up/reinforce class activities. Interestingly for the discussion of the nature of the blend, 73% agreed that as a result of the integration of web based tasks, more interactive activities take place *in* class. Finally, 91% agreed that having the formally assessed tasks had improved their overall coursework grade for this module.

3.11 Developing professional skills

There were examples of blended course redesigns in nursing programmes, prompted by the disciplinary body's emphasis on inter-professional learning at Oxford Brookes University (Sharpe et al., 2006), Eastonhall and Deepshire.

There are some disciplines which require use of IT as a competency and this has been a driver for a redesign (Molesworth, 2004). The Business School at Oxford Brookes University have identified online collaborative work as a key skill for modern business practice and so have introduced a collaborative 'virtual task' into the Team Challenges module. Evaluation using focus groups to collect student feedback is showing that students are highly satisfied with the appropriateness and relevance of this activity and the module leader reports a higher standard of reflection on team theory (Sharpe et al., 2006).

Box 3.2

Using Excel tasks to develop computer literacy in accountancy at the University of Limerick

Once qualified, professional accountants are required to demonstrate their competency in accountancy related IT skills. This was one of the drivers for the development of a blended 'Principles of Accounting' module for 600 students at the University of Limerick, Ireland.

The weekly lectures and twice weekly tutorials (held in a computer lab) have been supplemented by online course content, quizzes and Excel based tasks. The Excel tasks are optional but do provide up to 10% on the module mark if completed. Three quizzes are presented for one week each during the semester.

Student feedback has been collected over two years from web server logs, a survey of student views and focus groups. The analysis draws out a number of emerging themes important to the student experience including the important influence of the peer group, the marking scheme, study patterns and technical support. Of relevance here is the finding that students who held negative attitudes towards computers were least likely to complete the optional computer based tasks. In terms of developing professional competencies, it is important to support these students to locate and use online resources.

Concannon, Flynn and Campbell (2005)

In Australia, Ellem and McLaughlin (2005) give a different reason for wanting students to develop their IT skills. Rather than professional competency, they required students to submit all assessed work electronically to the Turnitin plagiarism detection software. Along with the mention of large classes, this was the driver for the course team to undertake a major course redesign to supplement face to face teaching with online resources, discussions and quizzes.

3.12 Educational rationales for blended e-learning

When we try to pin down the meaning of any modification of the term 'learning' such as e-learning, blended learning, distance learning or work-based learning, we will ultimately have to address what is understood by learning. If learning is the process of acquiring new knowledge, skills and awareness and taking on their habits, we still have to ask how that new knowledge, skills and awareness is acquired. Mayes and de Freitas (2004) organised learning theories that have impacted on e-learning developments into broad groupings: associative, constructivist (individual/cognitive or social) and situative (drawing on Greeno, Collins and Rusnick, 1996). We have drawn on a useful summary of these models and their implications for teaching and

assessment is provided by the JISC Effective Practice with e-Learning Guide and Workshops (JISC, 2005b).

The Tavistock Institute's review of pedagogic research in post-compulsory education observed that 'priority should be given to understanding and unpacking the pedagogic models underpinning the design of learning VLEs; unpacking the 'grand visions' and 'cultural logics' that shape design' (Cullen et al., 2002, p.16). We identified course evaluations that were clear that they aimed to improve learning and were able to explain how the expected learning occurred in relation to educational theory. These are discussed below using the framework from Mayes and de Freitas.

3.13 Blends to promote associative learning

In associative models of learning, it is understood that people learn by association, initially through basic stimulus-response conditioning, later through the capacity to associate concepts in a chain of reasoning, or to associate steps in a chain of activity to build a composite skill. In some learners, associativity leads to accuracy of reproduction or recall. Here, improvements in learning outcomes would be expected where there is a high component of acquisition of information and factual recall required.

Rationales to enhance learning through associative learning often start with the recognition that there are problem areas either in students' achievement in specific parts of the course (Boyle et al., 2003; Boyle, 2005) or overall course pass levels (Catley, 2004; Morris and Walker, 2006). Each of these studies developed learning resources and/or assessments and report significant improvements in student performance such as the case study reported in Box 3.3.

Box 3.3

Introduction of computer aided assessments into an introductory chemistry course at the University of Dundee

The course team recognised that there was a problem in the course with a 73% overall pass mark and 'weaker students failing to grasp some of the basics of the subject matter and only scraping a pass mark' (p.1). The students had complained about the time lag for feedback on the 8 practical reports and the inconsistency in quality of feedback and grading between the 10 markers.

The course was redesigned to include both high and low stakes computer aided assessments. The low stakes assessments were made available for a week, students were allowed unlimited attempts and their best mark was recorded. High stakes assessments were unseen and conducted under examination invigilation conditions in computer labs.

The pass rate improved to 93% and student feedback and analysis of logs identified the low stakes assessments as being critical. Students completed each of the 5 low stakes assessments on average three or four times and received instant feedback which provided clues to the answer, but not the actual answer.

Student feedback was extremely positive and students identified the multiple attempts with feedback as highly motivating and helpful:

"The ability to re-do tests and assignments again once you have already done it is good. It enables you to continue learning the more you try it." (p.5)

Out of a class size of 191, 91 responses to a feedback questionnaire were received. 99% of those who responded said the online tutorials improved their understanding of the topics covered and 93% felt that the marks awarded for these were appropriate. 90% of respondents said that the online assessments for the practicals improved their understanding and 99% felt the marks awarded were appropriate.

Morris and Walker (2006)

3.14 Blends to promote constructivist learning

In constructivist models of learning, it is understood that people learn by active construction of ideas and building of skills, through exploration, experimentation, receiving feedback, and adapting themselves accordingly. Students will be engaged in activities which focus on real world, authentic tasks and require collaboration with their peers. Learning constructively leads to the integration of concepts and skills into the learner's existing conceptual or competency structures. In models of social constructivism, other people and groups learn with the support of dialogue and in the process of collaborative activity. Improvements in learning outcomes would be demonstrated by more sophisticated understanding of complex issues or demonstration of higher order thinking.

Recent reviews of the pedagogic literature in the UK and Australia both confirm that constructivism is the dominant model of learning influencing school and post-compulsory education (Cullen et al., 2002; Eklund et al., 2003). As Cullen et al note in their review 'many practices are tied to a 'grand learning theory'' (p.16). We found frequent mention of constructivism underpinning the course design, but few explicit articulations of what this meant in practice.

Many of the earliest e-learning environments and activities were collaborative group learning in asynchronous text based discussion environments which were designed around principles of social constructivism (see for example Mason and Kaye, 1989). In this model students are expected to create their own meaning from a variety of different perspectives through participation in collaborative tasks. More recently, Salmon's widely adopted five stage model of computer mediated communications describes a sequence of stages learners progress through, the fourth being 'knowledge construction'. Early work initially reported positive results, although as discussed in Chapter 5, more recent attempts to promote online communications and collaborations with undergraduate students are not as consistent (see Box 3.4). Given the inconsistent findings for the success of collaborative groupwork online, it seems important that we rehearse here the principles of constructivist design for learning.

Box 3.4

Discussion boards to support group project work in a final year module in nursing management at the University of the West of England

Hughes and Daykin (2002) used the rationale of moving towards a 'student-centred constructivist learning approach' to introduce discussion boards to support group project work. The number of face to face sessions were reduced to accommodate the

online work. The evaluation drew on a content analysis of the messages posted and two focus groups which sampled students who had read and posted to varying degrees. The interactions were analysed by Salmon's stages. There was no evidence of knowledge construction as students were reluctant to criticise each other's work online. The important finding of this study in the context of this discussion of rationale, is that Hughes and Daykin conclude by suggesting that online tutors need more preparation for the facilitation skills required to scaffold the knowledge construction phase.

Constructivism is a cognitive model based on an understanding of how human attention, memory and language operates. One of the well established findings is the importance of relating incoming information to existing knowledge structures or 'schema'. That is, learners are influenced by what they already know. Therefore, constructivist pedagogies recommend that new information is carefully sequenced and that learners are supported or 'scaffolded' by expert tutors and environments who present new material and questions at the appropriate time.

Clark and James (2005) present a coherent rationale for their blended design based on principles of 'guided construction'. They describe the redesign of an introductory soil science module at the University of South Australia. Here weekly online readings with question prompts replaced the course textbook. There were two lectures every week. The first lecture was of a traditional type, at the end of which that week's course readings and questions were released. Students were expected to work on their answers before the next lecture which was run in a question and answer format with no new information presented. Students were encouraged to use the online discussion forum to work collaboratively on their answers, although few did. Student feedback on the use of questions was overwhelmingly positive with 63 of the 65 responses to end of module questionnaire agreeing or strongly agreeing with 'the online readings and associated questions helped my learning'. In focus groups it emerged that students had some difficulties accessing course readings, but found the questions very useful e.g. "If you did the study questions, the class provided immediate feedback to see if you are on the right track."

3.15 Blends to promote situative learning

In situative models of learning, it is understood that people learn through participation in communities of practice, progressing from novice to expert through observation, reflection, mentorship, and legitimate peripheral participation in community activities. Situativity leads to the development of habits, values, identities and skills that are relevant to and supported by that community. Improvements in learning outcomes would be demonstrated by improvement in learning the skills and knowledge of a particular discipline in the culture of its use in a working organisation.

There are examples of courses with a clear rationale to develop the skills, attitudes and behaviours of practitioners in the subject's profession. The professional skills might be quite specific to the discipline, including developing differential diagnosis in veterinarian science (Ellis, Marcus and Taylor, 2005), writing guidelines for users in computing (Oliver, 2006), negotiating and bargaining in world trade economics (Carr et al., 2004) and legal skills in a personal injury claim negotiation scenario (Maharg, 2001). This model of learning is particularly suitable to postgraduate and professional development work based programmes, much of which fall outside the scope of this review of undergraduate teaching.

In undergraduate teaching, Ellis et al. (2005) and Ziegenmeyer and Kupetz (2005) both used case studies to create opportunities for their students to behave as novice practitioners. Ellis et al investigated the experience of veterinarian science students in an Australian university. The course blended face to face lectures, tutorials and laboratory sessions with detailed cases presented as online resources (e.g. history, laboratory test results, images, relevant research papers). This case based learning is described as ‘learning through being situated in an authentic context that requires the learner to acquire skills and knowledge in order to solve a problem or manipulate a solution’ (p. 240). Students accessed the case based resources via their VLE and developed lists of differential diagnoses for further investigation with diagnostic tests, requiring them to think and act like practitioners. Ziegenmeyer and Kupetz also used case studies and here developed hypertext multimedia based studies to support students teachers to link the theoretical and practical aspects of their learning experiences to gain the “experience of acting as a teacher in an authentic teaching context” (p. 179).

4 Evaluating and monitoring blended e-learning

4.1 Overview

The third research question was to identify the monitoring and evaluation strategies being adopted to ensure and enhance the quality of blended learning. Our approach throughout this review is practice-focused so we limited this section to review examples of approaches to evaluating technology in use in blended contexts. Following this approach, we build on the three characterisations of blended e-learning in use described in Chapter 2; reviewing institutional, course and then holistic evaluations. In each section we have drawn together our findings from the literature and the transcripts and documents obtained from the institutional visits.

All seven institutions we visited described current plans for initiating institutional monitoring and evaluation strategies to assess their students' experiences. All were finding establishing institutional level practices problematic. We suggest this was due to the pressure to implement rather than evaluate, the low status of pedagogic research, and poorly defined measures of institutional success in embedding blended e-learning. All institutions welcomed the opportunity to share approaches both through this review and the Academy's Benchmarking e-Learning project (HEA, 2006). In response to the requests for support around evaluation, we have taken the opportunity to highlight examples of suitable approaches and techniques and make recommendations for those wanting to undertake their own evaluations.

Despite the difficulties around establishing institutional level monitoring and evaluation strategies, we identified and described a number of effective practices in various levels of operation in universities: regular module evaluations being used to inform departmental action plans, triangulated evaluations of students' VLE use and institutional support for the collection and dissemination of case studies. We also suggest the promotion of pedagogic research both within institutions and for assessing the impact of course redesigns. We draw on the pedagogic literature to make recommendations about conducting such research: triangulation of data, collection of rich data and planning longitudinal and ethnographic studies. Finally, we note the importance of making use of the findings of evaluations in course planning and redesign and note examples where this had been achieved.

4.2 Approaches to institutional evaluations

It is clear both from the literature and from our institutional visits that systematic, institutional evaluation of blended e-learning is problematic. Bricheno et al. (2004, p. 7) in a major review of the impact of large scale networked learning in HE and FE institutions say 'the evaluation of staff and student experiences appears to be an area that institutions are just beginning to address and one that would benefit from further investigation'. There are several reasons for this. Where a central e-learning unit is expected to monitor and evaluate, the pressure is to maintain and deliver services rather than to judge their effectiveness, i.e. to implement rather than evaluate. Another factor is the relatively low status of pedagogic research in higher education, which means that for many institutions measuring anything other than some level of e-learning 'activity' is a low priority.

As this review was underway, the Academy also funded 12 institutions to pilot five different methodologies and toolsets for benchmarking e-learning. Preliminary

findings from the e-Benchmarking project suggest that even with institutional support for conducting evaluations, the measures of institutional success in blended e-learning are often not clearly defined and relevant data may not be available. “One of the key lessons from the pilot phase of the exercise is that many institutions just did not have the data to hand and so far from e-benchmarking being a collation exercise it required considerable data generation effort.” (Morrison, 2006).

We found that institutional evaluation largely relies on gathering data that comes easily to hand. In the main these are things like VLE usage data, evaluations of pilot or pump-priming projects that include dissemination outcomes as condition of funding, and small case studies by enthusiastic innovators of e-learning. While all of these methods provide useful insights into aspects of blended e-learning, they are rarely drawn together in such a way that they can answer the question, ‘what is the impact of blended learning on the student experience in this institution?’ Indeed the e-Benchmarking project is increasing referring to students experience*s* rather than ‘the student experience’ in recognition that students will experience the same institutional context and programme in different ways.

All seven of the institutions that we visited described current plans for initiating institutional evaluation research. They all perceived gaps in their current evaluation methods and often these concerned understanding the student experience. As one participant said to us:

> *One of the things that’s been seriously lacking over the last five years at least, has been a lack of interest in evaluation, proper evaluation, not lip service evaluation like the student satisfaction surveys (Blackwater 2).*

At Longside, despite widely disseminated case studies and publications about e-learning going back at least five years,

> *We don't have any systematic, institution-wide, sufficiently detailed research into the student experience in my view (Longside 1).*

With these perceptions in mind and a generalised concern about scarce resources for conducting evaluation work, it is not surprising that several of the institutions we visited welcomed the Academy’s forthcoming e-Benchmarking project as providing vital assistance with institutional evaluation.

4.3 Institutional evaluations in the bedding in phase

The common experience following the introduction of an institutional VLE is an initial period in which the dominant strategy is encouraging staff and students to use it. This ‘bedding in period' typically seems to last three to five years. Salmon (2005, p. 208) notes that ‘most HEIs are still struggling to engage a significant percentage of students and staff in e-learning’ and most institutions within the sector are still in this ‘bedding in’ stage.

Because of the way we selected institutions to visit, our institutions were beyond this phase, but could reflect back on it. The institutions we visited described a variety of evaluation methods that they used during their ‘bedding in phase’. At one end are highly formalised processes such as external audits. Blackwater, for example, mentioned an audit of the management of their institutional VLE conducted by a prominent accounting firm. Such external audits of institutional VLEs are increasingly common, being mandated by the business processes of universities.

> *I think it is that notion of mission critical. People now regard it in terms of things like the risk assessment, you know, which systems are considered to be the most important, from a risk assessment point of view. The VLE is now well up the list, because of the amount of stick we get if things fall over.* (Eastonhall 1)

Such business-style audits are 'foreign' and distant to the academics charged with managing the incorporation of learning technology into the daily learning and teaching processes of their institutions. It is not clear whether or how they are used to shape forward development of blended e-learning within their institutions.

At the other end are quite informal techniques that are closely associated with institutional change management processes. Alvesson (2002) uses the term 'symbolic effectiveness' to emphasise the importance of how change processes are perceived by institutional members. Symbolic effectiveness is likely to be measured by things like attendance at staff development events, the tenor of discussions at internal seminars and debates, the dominant positions taken in internal discussion papers and so on. For example, a Kilderhill representative said:

> *It's really just all down to activities; it's just individuals talking about it, it's the institution talking about it, it's things going on, it's events going on. And the success factor is that people get involved in that. As I said earlier, [our] one day awareness event on e-learning had a hundred and fifty people at it. And that's a lot of people for Kilderhill. So a measure of success is that people came, and they were engaged for the whole day.* (Kilderhill 1)

Another informal measure is the absence of evidence of harm.

> *Blackwater 2: We also don't have any real evidence of not effectiveness.…*
>
> *Blackwater 1: We're not seeing students suddenly achieving hugely better, we're not seeing students suddenly achieving worse, we are seeing a lot of change in the day to day practice.*

Between the two extremes mentioned above — informal indicators that show that something is going on and high level business audits — sit a range of formal evaluation techniques. Almost all of our visit institutions had found ways to embed regular institutional-scale student satisfaction and/or VLE use surveys into their practice.

For example, Longside, Deepshire, and Westington administer a survey mirroring the National Student Survey to their final year students but with an additional question seeking a rating of the impact of the VLE on their learning. At Deepshire the item has two parts. The first part — 'did you use [the VLE] in your studies?' — separates respondents into those who can and cannot validly respond to the main question. This is a Likert five-scale item, 'did you find it useful to your studies?' There was dissatisfaction with the limitations of this approach. In at least one case this was explicit — it was 'a very poor question as it turned out' (Westington 1) — and in the others it was implied in discussions about how little can be learned from a single item.

At Longside a variety of surveys are used at various stages of the undergraduate experience. We were told that

The biggest one is the induction week cycle to get them involved and engaged in it and we get them in the system right from the very beginning. (Longside 2)

This is followed up at Longside with VLE satisfaction surveys that occur during each academic year. Metroville and Westington also use VLE satisfaction surveys. The VLE itself seems rarely used to administer these surveys, usually because of the poor rate of return when this was tried. At Metroville 'where we've tried in the past the rate of returns would be even less on online surveys than it was in questionnaires handed out in class, so that's the worry.' Students there are emailed a link to an online survey hosted at an external site.

As discussed in Chapter 5, students do value the access to course materials that VLEs provide. Moreover, at an institutional level the surveys themselves convey meaningful information about the institution's progress with embedding blended e-learning, especially where they have been conducted regularly over several years. At Westington they are used to inform departmental action plans. The case study in Box 4.1 illustrates a range of ways that the University evaluates blended e-learning in order to inform future development.

Box 4.1

Systematic module-level feedback supplemented with large-scale surveys

The University of Westington uses a variety of questionnaires at different scales with different foci.

Systematic background data …

Regular module evaluations are used in a systematic way to inform departmental action plans. Module feedback questionnaires include items on the use of the institutional VLE. These module questionnaires are centrally analysed and the results fed back to heads of department and programme leads. Programme tutors need to refer to the results in their annual evaluation reports. The cycle is completed when these evaluation reports inform departmental and programme action plans.

… punctuated by large student and staff surveys

Along with this regular, systematic collection and reporting of VLE use at the module and programme level, Westington has performed large, triangulated studies of both staff and student experiences and attitudes to the VLE. These provide institutional level data that are used to inform development work on the VLE and approaches to providing staff and student support. They are seldom conducted more frequently than triennially and correspond with major shifts in strategic planning and development.

The student survey involved questionnaires and focus groups in which students' usage patterns and satisfaction ratings were gathered. They surveyed approximately 10 percent of first and final year undergraduate students, approximately one thousand learners. This was delivered on Optical Mark Reader (OMR) sheets at the end of lectures to maximise returns. The questionnaire data was complemented by focus groups of students representing all the faculties.

This was preceded by a survey of staff. This was a substantial six-month effort, conducted by a project team of five members and two research assistants and

producing a 61 page internal report (University of Westington 2003). Questionnaires were sent to all (over 800) academic contract staff and follow up interviews were conducted with over 30 staff categorised as VLE users, non-users and faculty champions. It gave the institution a very detailed snapshot of how the VLE was being used, including distribution of use by various classifications of staff (e.g. teachers, managers, researchers, by faculty and department) as well as the VLE tools and facilities that tended to predominate in each staff category. Not surprisingly, it found that the VLE was used at that time primarily as 'an information source and administrative tool' (University of Westington 2003, p 3).

This staff survey revealed a variety of important issues that planners needed to attend to. For example, there was widespread concern about inequity of student access to IT, especially for mature, off-campus and non-standard entry students. A variety of staff development and technical needs emerged, including too-frequent upgrades to the VLE, a need for hands-on support for staff users and disciplinary differences in perceptions of the value of the VLE.

Perhaps one of the most important findings was a need to 'commission some follow-up research into [Westington] students' views and experiences' (University of Westington 2003, p 4). As a result a survey of new students that elicited their initial views on the VLE was conducted in 2005.

4.4 Institutional evaluations of VLEs in use

Development within the institution can often be marked by changes in the survey instruments themselves or how they are used. The institutions that we visited, having already spent three or more years promoting the use of their VLEs, all saw themselves as entering a new, more mature phase of embedding blended e-learning. Metroville for example articulates the goal of using their VLE as a learning space rather than a repository. Asked how they were monitoring progress towards this, the response was:

> *We aren't at the moment. And this is one of the things which will come in the next iteration of the plan. At the moment the pressure and the emphasis has just been getting staff familiar with it by and large, getting them comfortable with it, exploring the notion of just how it might be used.* (Metroville 1)

One element of Metroville's new approach is to adapt analysis of the VLE survey to try to identify module tutors who are using the VLE 'in an exciting and innovative way' (Metroville 1).

At Blackwater, a substantial research effort into the student experience involving questionnaires, focus groups and also investigating staff perspectives is planned this year. Underlying this effort and similar plans in other institutions is a perception that, having achieved initial 'penetration' of the VLE into institutional life the next period involves more sophisticated uses of educational technologies and more complex monitoring and evaluation processes.

> *In a very real sense the purpose of the big evaluation this year is to set a baseline, and say alright, we're five years into this, four or five years into this, we've got reasonably deep penetration across the university in terms of breadth of usage of some kind… but in terms of having real evidence of real effectiveness, the answer is probably not.* (Blackwater 1)

Westington is exploring a variety of ideas for gathering more detailed information about the student experience. For example, 'things like video diaries and trying to get alternative approaches. To give us another view on how students react' (Westington 1). They are also aiming to capture more sophisticated evidence about staff use of the VLE:

> *There were no tools that could allow you to analyse the detail of how someone has used the [VLE]. We now have agreement with our Vice-Chancellor and the students union that we can start doing that…. We're looking at ways we can start getting data on the exact use of the functionality in [the VLE]. How are staff using it for learning and teaching?* (Westington 1)

Deepshire is characterised by 'the extent to which the schools basically run their own affairs. I mean we're really eight universities' (Deepshire 3). Therefore they have attempted to address evaluation at the school level:

> *There have been particular studies that some schools have undertaken to look at courses that use e-learning. Three schools are involved in that at the moment, and we're also planning . . . to do a questionnaire for schools that don't have the time maybe to undertake a full evaluation as these three have done. To at least have a questionnaire that they can use that will help process and feed the details back to the school [and] will inform us as the institution what's happening, but also will inform the individual module leaders about how their course went and what the students thought about it.* (Deepshire 2)

Satisfaction surveys tend not to reveal 'how' or 'with what' a given application helped students to learn. They offer little or no insight into changes in the student learning experience. In those that we saw institutions using, the most detailed ones could differentiate between students on the basis of module enrolment and occasionally attributes like gender, but they did not differentiate between students with diverse needs and preferences, e.g. disability, age, prior educational experience, work status. Yet a variety of studies show these are meaningful and important variables to do with the impact of the use of technologies on student learning (see Sharpe et al. 2005 for review).

A further problem with satisfaction surveys is that they can hold the implication of a withdrawal of the service given a strong negative response. How many students would want that, whether the VLE was important to them or not?

Triangulation — using another method or source of data to confirm or refute observations or analysis from a single source — is a problem for all the institutions we visited. At least there are practical difficulties with drawing together, comparing and contrasting the variety of different data that are collected in the normal routines. This appears to be due to a lack of resources dedicated to institutional researching of blended e-learning. We were told a variety of stories that illustrate this. For example:

> *I did a very quick and dirty bit of research myself on some of the data — and it was quick and dirty which is why I've not used it and published it, I just did it for my own interest — but what I tried to do was look at the correspondence between subject areas, courses and group and student satisfaction with what was labelled [the VLE] rather than e-learning…*
>
> *It did produce a kind of module by module result, which is good, that where there was more use students tended to be more satisfied…. And I think on a triangulation basis I suppose, although every bit of individual evidence doesn't*

stand up really to a great deal of scrutiny, if you've got enough separate ones of them then it does begin to look like a duck at some point. (Longside 1)

Ellaway, Dewhurst and McLeod (2004) argue for a holistic and/or situated approach to evaluating VLEs in use where 'the question which should be asked about a VLE is not 'what can it do?' but rather 'what is it doing?' thereby focusing on its function and role in the situated educational context' (p. 127).Taking such an approach at the University of Edinburgh they developed an evaluation instrument based on Wenger's (1998) Learning Architecture Framework (LAF) for communities of practice. This instrument is designed to evaluate how successfully a VLE integrated into an existing course supports nine dimensions of the community of practice that can be presumed to exist for that course. If the presumption of an extant community of practice cannot be validly made, for example for a short course or in a modular programme of study, the instrument could not be used. The application of this tool in a long-standing medical programme at Edinburgh University revealed areas for improvement in the LAF dimensions of 'course coordination (e.g. timetables), jurisdiction (e.g. rules and authority) and exploration (e.g. secondary learning materials) while other aspects are relatively strong' (p. 142).

4.5 Use of course review in institutional evaluation

In this section we move from a focus on satisfaction surveys at the institutional level to course and module level evaluation. Evaluations at this level can serve a variety of purposes. They provide institutions with a means to map blended e-learning applications and pedagogies and they have the potential to gather rich data about the student experience of e-learning.

All of our visit institutions described module and course evaluations as key sources of evaluation data. Existing module evaluation instruments need to be adapted however, as they tend not to gather appropriate data. Deepshire 1 explained:

One of the questions for our school is, how do you actually evaluate the students' experience of this when they're out in the practice setting? So we just thought, oh well, that's not going to be a problem, we'll just use our ordinary module evaluation. Well it wasn't going to work was it? It's not asking the right sort of questions.

Few had systematic ways of drawing module/course level data upwards for institutional level analysis. As described in Box 4.1, Westington did this using standard module evaluations that were used to inform department action plans. Eastonhall was just about to accomplish this with 'a question or two being added' to 'module questionnaires and end of stage questionnaires' (Eastonhall 2). Longside has incorporated a single item into their module evaluation form asking students to rate the impact of online learning on their work. We were told:

We find a very strong correlation between 'yes, it has very much enhanced my work', and those that use it. Of course there will be twenty five, thirty percent of 'don't knows', or 'can't answer', because they're not using it. But when it is answered, it is always, yes it is enhancing my work. We never get the other response. (Longside 2)

As mentioned above, Westington is investigating technologies that will help it gather data about how its VLE is being used for learning, but none of the other visit

institutions are doing this. Sharpe, Benfield and Francis (2006) refer to a system being used at Oxford Brookes University to classify the 'Mode of Engagement' of each VLE module by its primary learning uses. Mode 1 VLE use means providing basic course information online, e.g. module handbooks, lecture notes, and similar downloadable resources. Mode 2 use, blended learning, emphasises use of the VLE as an environment for active learning. It is divided into 4 sub-categories – enhanced content, communication, assessment and feedback, and collaboration. Mode 3 refers to a fully online module or course. An audit database holds these descriptors about each VLE site. This database should allow the institution to gather more detailed information about the pedagogical enhancements being provided by the VLE. It can, for example, allow an institutional evaluation to locate all the modules using the VLE communication tools for more detailed investigation.

The function of regular course and module reviews in relation to blended learning at our visit institutions was mainly quality assurance. For example, at Deepshire

> *there is an annual review of each program. And so within that annual programme review, where there has been, in inverted commas, what I might call modification or development, then you would anticipate that [feedback on e-learning] would be mentioned.* (Deepshire 1)

This approach rarely captures information about impact on students' learning experiences, but aims primarily at 'problem catching'. For example,

> *we have student questionnaires which all students on all modules do … that would say well, actually there's something wrong with this module, and we could then unpack what that is. We look at it in terms of student attainment, and modules which are way out of line with other modules get looked at and people get asked questions like, ok, 'well how are you using [the VLE] help and support to structure the student learning here?'* (Metroville 1)

Both Metroville and Blackwater explained that they saw their five-yearly course review process as the most important and potentially valuable quality assurance mechanism. Metroville had implemented a process 'for the last two or three years' in which course teams are annually required to report upwards on the 'basic level of take up' of the VLE'. But

> *we probably need to go beyond that. The monitoring process won't be as useful for [quality assurance] as the review process. So the five year review when we go into each subject area and really unpack things in detail will be an opportunity just to see where they are with [the VLE].* (Metroville 1)

These more rigorous five year review processes gather higher quality evidence than regular module evaluations and because they are embedded in a course renewal process are more likely to lead to blended learning innovations. Still, they are limited by the long time period between successive reviews and validation systems need to be adapted to make blended e-learning reporting an explicit element of the process.

4.6 Use of case studies in institutional evaluations

Case studies are the primary way that institutions put together a picture of the impact of their blended learning innovations on the student learning experience.

> *The examples range from very large, externally funded projects, through to internally funded through self generated income in the law school, through to activity at a local level with people implementing different techniques and so on.* (Kilderhill 1)

Particularly in the early, 'bedding in' phase of institutional e-learning, development typically involves pump-priming projects to stimulate development and provide exemplars for the academic community (Stiles, 2003). Such projects almost always involve a formal dissemination requirement, and usually the larger the price tag the more rigorous the evaluation that is required.

Eastonhall and Longside's schools of Health exemplify this. 'The professional bodies for health care practitioners are currently driving the development of flexible, inter-professional, pre-registration programmes and so both institutions have embarked on substantial blended e-learning innovations involving large, multi-professional cohorts. The ambitious scale of these projects means that both schools are allocating resources to evaluating their impact and case studies are likely to be published in a year or two.

Most of the institutions we visited used some form of incentives to establish innovative blended e-learning projects and these 'development projects have inbuilt evaluation' (Westington 1). The case studies in Boxes 4.2 and 4.3 illustrate two contrasting approaches.

Box 4.2

Internal project funding in an old, research-focused institution

Eastonhall is an 'old' university with a focus on research. It has no tradition of internally funding major teaching and learning projects. It does, like many other UK HEIs, have a teachers' prize that it calls the Chancellor's Award, modelled on the National Teaching Fellowship Scheme that 'gives five thousand pounds just for a person to spend on a project plus an automatic salary increment' (Eastonhall 1). This award will sometimes involve a blended learning innovation whose evaluation is disseminated.

It is a significant innovation at Eastonhall to have established a bidding process for a set of sizeable e-learning grants that lead to funded projects. Five projects of at least £25000 each were funded in 2006. Although it was not a criterion for selection, the projects are distributed evenly across the University's academic schools. The key selection criteria were impact on the students experience and evaluation of the impact. Each of these projects will lead to a major evaluation output widely disseminated across the institution and probably nationally as well.

The university's small team of educational development staff are integral to this process. They helped to formulate and implement the bidding and selection process and will play a key role in providing support for effective dissemination of the results of these projects.

There is a 'widespread demand among practitioners for evaluation studies' (Beetham, 2005b, p 85). A national project to help address this need was launched by the JISC, which funded a set of case studies that are freely available to practitioners. An associated programme of national workshops aimed at 'advanced practitioners, e-learning champions, staff developers and other people supporting

effective practice with e-learning' disseminated tools such as an *Effective Practice Evaluator* and a case study template developed in association with the Academy Subject Centres (JISC, 2005b). These templates explicitly aim to assist institutions with the resource-intensive work of collecting case studies that document the lessons of their educational innovations.

Collecting case studies and then finding ways to disseminate them effectively is a major staff development effort for most institutions. Westington hosts case studies and exemplars within its VLE site. Most, however, house their case studies within web sites of their educational development or e-learning units. Longside has an extensive collection of institutional case studies and papers on e-learning but there has been a noticeable drop in new additions to these in the last two years. Longside 3 explained that 'we haven't got a resource … we're very understaffed'.

Although practitioners find case studies to be informative, there is little evidence of teaching staff accessing resources for their own use without mediation from others. (Beetham, 2002). So, educational developers, learning technologists and others with a role in the development of blended e-learning often devote considerable time and energy to gathering good examples to use in their work with staff. The impact of such efforts are maximised by robust institutional mechanisms for sharing the examples. Regular internal conferences and prominent internal journals were often cited by our visit institutions as key methods.

Case studies present complex issues to do with making them accessible to practitioners. Many factors influence how 'accessible' they are. A familiar or consistent style can be helpful, but if they are too 'uniform' they may lose some 'fitness for purpose' in adequately describing the important features of the innovation, especially those that are transferable to other contexts or disciplines. Practitioners frequently prefer to see examples from their own disciplines, rather than generic ones, and they do not want them unduly 'sanitised'. In short, as well as the successes they want to know what failed or was hard to accomplish. Consequently active institutional networks of educational developers, learning technologists and e-learning practitioners have an important role to play as 'social repositories' and disseminators of such institutional case studies.

Box 4.3

Promoting pedagogic research in a new university

Longside is a 'new' university with a focus on teaching quality. It has invested significant resources into embedding and documenting e-learning innovations. It has gathered and disseminated an impressive collection of case studies of institutional blended e-learning innovations over many years and it has well-established methods of internal and external dissemination. The university has achieved this with effective use of its educational development unit and Teaching Fellows.

Support for generating case studies

Longside has funded internal Teaching Fellows at Principal Lecturer level who support blended e-learning and it has three National Teaching Fellows involved in e-learning. Additionally Longside has a sizeable and prominent educational development unit that has played a key role in promoting, collecting and disseminating case studies. Members of the educational development unit offer consultancy and support to academic staff in developing blended e-learning innovations. They actively seek opportunities to document this work, sometimes as

relatively short narratives of the project and others as more formal research papers. Some are authored by the educational developers, some by the module teachers, others are collaborative efforts.

Dissemination

The educational developers and teaching fellows are involved in externally funded national and international e-learning projects leading to dissemination outputs and they attend conferences that disseminate examples of blended learning innovations from their institution. They also play a key role in the user network associated with their institutional VLE.

Dissemination occurs in both formal and informal ways. Formally there are events like academic courses, workshops and seminars and the educational development unit hosts an extensive set of case studies on its web site. A well-attended annual internal learning and teaching conference provides a ready-made internal dissemination avenue for staff to disseminate their work. Day-to-day links between educational developers, teaching fellows and academic staff involve informal, often word-of-mouth dissemination of case studies and exemplars from both inside and outside the institution.

This high profile case study collection work is supplemented at Longside by its PGCert programme for new teaching staff. This course incorporates action learning and work-based learning and is assessed by a portfolio of work. In one of the modules within the certificate participants need to demonstrate an innovation applied within a teaching and learning context. Often this takes the form of a small case study of blended e-learning innovation and evaluation.

Strategic alignment

A recent strategic initiative by the University to increase research activity gives this work added impetus. This policy aims to promote active research by all academics, if not in their discipline then in pedagogic research. A workload allocation model that includes explicit time allocations for such research is being implemented to resource the initiative.

4.7 Recommendations for institutional evaluation

In response to the interest in conducting institutional level evaluations, we offer the following recommendations based on our review:

- For large scale surveys, careful design of the sampling strategy is critical. Self-selecting surveys might lead to samples that do not allow conclusions to be drawn for the general student population. Haywood et al (2004) at the University of Edinburgh found that their self-selecting respondents were generally representative of the undergraduate population for age and gender. On the other hand the University of Eastonhall (2004) found that females and just two academic schools dominated their sample in a survey of nearly 700 self-selected student users of their VLE.
- Purposive sampling can be an effective way of addressing specific institutional questions. For example Haywood et al. (2004) used VLE activity

logs to sample from students designated as high users of the VLE. Or an institution might want to focus on some demographic group that is important to the institutional strategy, e.g. those with disabilities, international students, mature age students, etc.

- Survey presentation and delivery methods should be constructed to maximise rates of return and avoid biased samples. Haywood et al. (2004) reported better response rates to their online survey than paper ones but their sampling strategy targeted 'high' level users of the VLE. To improve on poor rates of return for online surveys Metroville used email links to an online survey while Westington delivered surveys in lectures using paper-based forms suitable for optical mark reading. Offering incentives such as small prizes to randomly selected respondents can also improve response rates. Saunders and Pincas (2004) offered their survey both online and face-to-face so as to prevent bias towards highly IT-literate respondents.
- It can be worth trialling survey items first using follow-up interviews to ascertain how respondents interpret them. This will help avoid using meaningless or potentially leading questions, as for example, where a 'satisfaction' item might unwittingly carry an implication that the service could be withdrawn.
- Ask some questions which offer students the opportunity to give 'new' information. For example, Haywood et al. (2004) asked students to list three things they chose to do with the VLE and three they were compelled to do. These items are open-ended and so they need additional time and expertise to code and analyse over standard 'tick the box' items.
- Make sure the results are used. Evaluation reports can easily gather dust on a shelf. A good example of responding to evaluation results is offered by Weyers et al., (2004) at Dundee. They reported staff finding student comments 'a real eye-opener'. Amongst generally high levels of satisfaction with their VLE a complaint was inconsistency in how staff used the VLE. The evaluators then wrote to heads of departments giving advice on departmental approaches to VLE including the use of standardised templates and guidance on communication methods.
- Triangulate surveys with other data. For example, Aspden and Helm (2004) asked nine self selecting students who were registered on four or more VLE sites to keep diaries for two weeks, after which they were interviewed. This small amount of rich data provided insights into the results of earlier evaluation of how students use the VLE.
- Consider carrying out institutional surveys on three- or four-yearly cycles in order to gather richer, more varied data, to better align them with strategic planning and better resource them than annual student satisfaction surveys. Provided these less frequent surveys are conducted against a background of effective course/module level evaluation, they can provide results that institutions find easier to act on than the more frequent, less thorough variety.

4.8 Approaches to course evaluations

In Chapter 2 we identified transformative course level practices, underpinned by radical course designs, as a small but growing characterisation of blended e-learning. This type of blended e-learning is well represented in the pedagogic literature which is dominated by course level evaluations. Again, we found a great deal of interest in the approaches, methods and tools employed by such evaluation research. Since any research methodology is driven by the aims and purposes of the research, here we summarise approaches to course evaluations according to their primary purpose.

We use Chelimsky and Shadish's (1997) framework for understanding the purposes of evaluation: evaluation for accountability (to find evidence improvement in student performance), evaluation for knowledge (to better understand the student experience) and evaluation for development (to lead to course improvements).

4.9 Evaluations of the impact on student performance

Evaluation for accountability requires some criteria against which the evaluation may be measured such as student performance in educational contexts. Evaluations of blended e-learning which have attempted to show correlations between student performance and their use of technology are relatively infrequent. In part this arises from the difficulty of isolating the variable 'use of technology' in course designs, or indeed of isolating any single variable in dynamically complex educational activity systems. For example, Davies (2004) reports improved development of higher order thinking skills by higher performing students through an online peer marking exercise. No doubt the computerised marking process facilitated the design and delivery of the exercise but it is unclear the extent to which peer marking, the use of technology, or the combination of both led to improved outcomes. Kennedy and Cutts (2005) investigated the impact of electronic voting systems (EVS) in a first year computing subject in an Australian university. They found a significant correlation between performance on the module and level of accurate responses using EVS during lectures. They were unable to adequately account for the association, which may have been connected with motivation, ability, attendance in lectures, or even ways of thinking in response to use of the technology.

Davies and Graff (2005) looked for a correlation between level of interaction in online discussion groups and final grades. Despite some associations between levels of online activity and grades, they concluded that higher levels of participation did not necessarily result in better grades. A variety of methodological issues emerge from this example. An association between online participation and grades might have been more likely if the variable had been quality rather than quantity of participation. The difficulty with designing such an investigation is arriving at a measurable and widely agreed definition of quality of interaction. Other factors that might impact on outcomes from online discussions concern levels of compulsion to participate and with who the interaction occurs, including especially the tutor.

A second reason for relatively few studies showing improved outcomes as a direct result of blended e-learning, concerns evaluation design. Alexander (1999) reports on a two year national study of the impact of ICT projects on student learning in Australian higher education institutions. This study found that while 87% of the 111 projects reported intentions to improve student learning outcomes, only 37% could actually report such an outcome. Flawed evaluation methodology was a major contributor to this. She found that frequently project evaluations looked at student reactions to and satisfaction with the project as measures of success and they failed to gather meaningful evidence of improvement in student learning outcomes. Alexander (pp 179-180) reported that using one or more of the following methods was effective in evaluating impact on student outcomes:

- comparison of performance of students who used the project with those who do not use it;
- a comparative study with control and treatment group and pre- and post-tests;
- comparison of students' solutions to problems in examinations, with those of students from other universities;

- pre- and post-tests combined with student interviews;
- review of students' learning journals;
- review of students' responses in examinations and overall performance in assessment;
- assessment of content and retention of learning;
- questionnaire concerning students' experience of the project as well as their reaction to it;
- questionnaires concerning students' perceptions of learning outcomes;
- questionnaires given to students before and after use of the project;
- interviews with students about changes in their conceptions;
- focus groups;
- experts' reviews; and
- observation of students' use of the project.

Two recent examples showing improved student performance in module results concern the use of computer aided assessment (CAA). Morris and Walker (2006) at the University of Dundee show improved student outcomes in the form of course/module results. Their project involved the radical redesign of a first year Chemistry course that incorporated formative and summative use of CAA. Regular and frequent formative online quizzes were introduced with multiple attempts allowed on each and feedback on incorrect answers was provided. The pass rate rose from 73% to 93% between successive cohorts with the introduction of CAA. Comparison of the entry qualifications of the cohorts showed a slightly less qualified CAA cohort than their predecessors. Similar effects of CAA were found by Catley (2004), who introduced optional formative quizzes in a compulsory first year law module and kept all other aspects of the teaching and learning programme the same as before. Students who did the optional quizzes performed significantly better than those who did not and there was a rise in the pass rate and in the number of firsts in the module as a whole.

4.10 Evaluations to understand the learner experience

Evaluation for knowledge aims to improve the understanding of the phenomenon. Kember (2003) argues that experimental research designs are difficult to achieve in naturalistic settings as control groups are difficult to establish practically or ethically. He argues that evidence for the impact of teaching innovations should be derived from triangulated designs. Triangulation, or the use of multiple methods, is an approach that aims at reaching in-depth understanding of complex phenomena. It is a strategy that 'adds rigor, breadth, complexity, richness and depth to any inquiry' (Denzin and Lincoln, 2003, p 8). Triangulation might involve any combination of gathering different data sources, using different researchers, applying different theories or perspectives to the same set of data, or using multiple methods to study the same problem (Robson, 2002).

The Students' Online Learning Experiences (SOLE) project (Timmis et al., 2004b) designed a triangulated approach to provide an in-depth set of case studies based on course modules across a range of subjects, with a wide range of data and collection methods. The main elements, assuming a 10 week unit, are as follows.

- Student questionnaires (weeks 1 and 9)
- Student diaries (weeks 3 and 8)
- Transaction logging (throughout)
- Recording of interactions (throughout)

- Interviews with tutor (weeks 1 and 9)
- Interview with students (week 9)

Box 4.4

A triangulated evaluation of the introduction of Personal Response Systems (PRS) in first year engineering mechanics module at the University of Strathclyde

Boyle and Nicol (2003) used a multi-method approach to evaluating the introduction of the PRS electronic voting system. The evaluation methodology involved:

- five focus groups (each with 6 students) that met twice

- a critical incident questionnaire in the form of an A4 sheet with five questions and spaces for comments to record immediate experiences

- a 36 statement Likert scale survey derived from issues that emerged from the focus group data

- a focus group discussion with 6 staff.

As well as showing high levels of student satisfaction with this introduction of technology into the classroom, the gathering of a variety of rich data allowed the project team to understand the ways in which the technology made a difference to students. For example, students commented on increased levels of motivation to be actively engaged in classroom sessions because they knew they might be called upon to respond; that the new structure of lectures allowed time for reflection and discussion; and that they valued the time given to exploratory talk about new concepts.

In America Cook, Cohen and Owsten (2003) evaluated technology enhancements to a large (444 students) introductory macroeconomics course. They triangulated data from server log files, a survey, a focus group and the text of an online discussion thread that sought students' reactions to the use of technology in the course. They also compared and found significant positive correlations between students' number of hits and overall course mark and number of sessions and overall course mark. The qualitative data acquired from the focus groups, open-ended survey items and online texts helped illustrate why certain usage patterns had emerged from the log files. For example, log files showed that peer interaction on the course was limited. The qualitative data showed that students nevertheless valued this and that use of the technology could be redesigned to improve student-student interaction.

Clarke et al. (2004) also use a mixed method approach which illustrates the importance of adopting a multi-method approach in even a small study. They combined online tracking data about students' use of multiple choice questions (MCQs) with focus groups that helped them to interpret this data. Students self-selected themselves to control, paper-based or online MCQ groups. The evaluators were surprised to find that students' study patterns were entirely governed by the teaching timetable and that lecture notes were seen as vitally important. Usage data showed that students were following up links embedded in the MCQs, but they denied it. This showed that they were predominantly using a 'glance and bookmark'

strategy, saving resources for possible use at a later time rather than following them up immediately.

4.11 Evaluations leading to course improvements

Evaluation for development implies an original aim of improvement and we noted studies in the literature that were explicit about how the data collected had informed the course team's decision making process. These examples highlight the importance of not just course redesign, but iterative course redesign which makes use of evaluative feedback, as a critical success factor in blended e-learning.

Weyers et al. (2004) conducted an institutional survey at the University of Dundee and reported staff finding student comments 'a real eye-opener'. Amongst generally high levels of satisfaction with their VLE a complaint was inconsistency in how staff used the VLE. The evaluators then wrote to heads of departments giving advice on departmental approaches to VLE including the use of standardised templates and guidance on communication methods.

O'Toole and Absalom (2003) in an Australian university noted that lecture attendance had dropped with the introduction of full text notes and recommended readings to mirror the lectures. In this example of evidence informed teaching, they state at the outset of the study that the results will inform what they do next: either to move towards virtual tutorials or remove the existing material from the internet and encourage lecture attendance. They found that students who attended lectures outperformed all other groupings of students by about 20% in a surprise quiz in the last tutorial of term. They propose, not to require attendance, but to change the type of material provided to supplement the lecture. Rather than providing an alternative, independent study type of lecture alternative, they plan to use the web to prompt interaction e.g. lecture summaries with questions.

Hughes and Daykin (2002) evaluated an undergraduate module in nursing management of 220 students and staff with minimal ICT skills. They used content analysis of student and staff online communications and two focus groups, purposively sampled from those who had read and posted the largest number of contributions, those who had posted a moderate number and those who had hardly posted at all. They found high levels of student anxiety associated with not initially understanding expectations of them and over assessment. Course teams are able to respond directly to findings such as these. This study exemplifies the potential for a direct impact on the design and delivery of a course.

4.12 Evaluating the holistic learner experience

The third characterisation of blended e-learning was a holistic view of the learner experience that includes the use of technology by the student to support their learning. Such studies are extremely rare, yet we note that as students entering higher education become more experienced in their use of technology it will be vital that we develop experience in evaluation approaches and techniques which will help us understand and empathise with their experience.

Aspden and Helm (2004) describe a qualitative study that builds upon earlier institutional evaluation work and uses a smaller scale, focused study to complement the earlier one. Although their study was not conducted at the course level, it would apply equally well in such a context. Their approach was designed to investigate the

student experience of using the VLE in a holistic way, i.e. to shed light on the complex interplay of the virtual and the physical and the choices that learners make in finding pathways to successful outcomes. The first phase of their research used interviews and observation to investigate student experiences of using the institutional VLE. They purposively sampled from high level users of the VLE. To extend this work in the next phase they recruited nine learners from the first phase investigation to keep diaries for two weeks. In this way they sought more insights into how the blended environment facilitated interaction and making connections. For example, the diaries were able to highlight how for students on placements, 'the virtual presence of the institution facilitates the maintenance of connections' (p. 249). They illustrated how an asynchronous discussion board can provide the time and flexibility for a student to reflect on a problem, develop confidence and become either more engaged or re-engaged with the class.

The Learner's Experience of e-Learning (LEX) research study conducted interviews and/or focus groups with 55 learners (Creanor et al., 2006b). In order to help elicit learner beliefs, intentions, motivations and feelings during the interview, they presented students with an artefact from their learning experience (e.g. a learning diary, blog, discussion transcript or e-portfolio) and used it to prompt discussions. The interview questioning and analysis of transcripts uses interpretative phenomenological analysis which supports interviewees to express their own detailed story. The methodology employed has enabled this project to provide a rich dataset of student experiences of e-learning across a range of sectors and technology uses.

4.13 Longitudinal evaluations

Robin Mason recommended in her keynote the 2001 Improving Student Learning conference (Mason, 2001) that large scale longitudinal studies of e-learning were urgently required. Partly this is to do with how the student experience is likely to differ in embedded as opposed to innovative implementations. The incorporation of learning technologies that make a real impact on student learning often involves radical course redesign and it is possible to evaluate such projects too early, when the real impact has yet to become measurable or stable. Stubbs, Martin and Endler (2006) conclude from their evaluation of such a radical redesign that evaluation should be improved through 'careful study of rich, longitudinal data' (p. 174).

Longitudinal studies may also be concerned with the student experience through a number of different courses. Arbaugh (2004) followed students in an American university over four years as they participated in online courses and reports positive changes in student satisfaction and perceptions over this period. Students developed more positive attitudes towards interaction with others and the ease of use of the environment, and this difference was most marked between their first and second experience. This is clearly an under researched area.

4.14 Ethnographic evaluations

McConnell (2005) illustrates the potential importance and power of the ethnographic approach to understanding the student experience of technology-mediated learning environments. Although it analyses a postgraduate course and is therefore not strictly part of this review, we refer to it here because it offers an accessible recent example of this approach. McConnell followed the work of three online groups working in

parallel. He analysed their interactions over the course of the activity, which, since they were online groups, amounted to many hundreds of pages of texts of asynchronous and synchronous online discussions. The paper offers a rich description and analysis of a range of complex team dynamics to which teachers rarely gain access. It details how members reacted to delayed responses to messages, levels of anxiety in individuals and how this impacted on team performance, the role of strong personalities and the decision-making processes adopted in the groups, and the ways in which tutors' interventions affected the teams both positively and negatively.

5 The learner experience of blended e-learning

5.1 Overview

The fourth research question aimed to address the impact of blended e-learning on the student experience.

There is general agreement that the student perspective is under-represented in e-learning research generally (Sharpe et al, 2005; Saunders and Pincas, 2004; Beetham, 2005b) and in reviews of specific technologies such as the use of interactive whiteboards (Smith, Higgins et al, 2005) and e-portfolios (Tosh et al., 2005). Moreover, where students have been asked to share their perspectives, there are examples of student experiences being markedly different from those reported by staff (Williams, 2002) or students giving reasons for supporting the blend that were different from why the blend was introduced (Timmis et al, 2004a; Clark and James, 2005). The Enhancing Teaching-Learning Environments in Undergraduate Courses project have found differences between the perspectives of students and practitioners when looking at the whole teaching and learning experience, and we see no reason why blended e-learning should be any different:

> Besides all the complexity created by marked differences across subject areas and myriad individual differences among both staff and students which prevent simple patterns emerging, there are additional crucial differences between the idealized world described by research and the actual world experienced by the participants. (Entwistle et al., 2002)

Following the three characterisations of blended e-learning introduced in Chapter 2, this chapter starts by asking how students experience the provision of course information and supplementary course resources. In this section, we draw mostly on the findings from institutional evaluations of VLE use. We find that the student response is overwhelmingly positive and students are making regular and frequent use of electronic resources with few reported problems of access. Students value flexible access from home, and mention course notes as the most useful resource. The impact of the provision of course notes is discussed in relation to support for students with disabilities, and the impact on attendance. Students are concerned about the costs associated with downloading and printing and are critical of inconsistent use between staff and modules.

We assess next the impact of technology on the student experience of communication and interaction with course content and with others. Here we draw mainly on evaluations of courses which have been redesigned with clear principles underlying the changes they have introduced. Here the emphasis shifts away from the VLE to take account of other technologies that are available to support and perhaps even change how students learn. There are many case studies from dedicated and innovative lecturers available and we have been selective in those we have chosen to report. We find that while students recognise the value in the blend of face to face and technology supported activities, there are large individual differences in how they experience the blend. We have seen that students vary in how they conceive of their own, and their tutors, roles in the learning process and this may be critical to their success.

There is an increasing recognition that students are making use of their own technology as well as those provided for them and that they are doing this in ways that are not planned for, difficult to predict and may not be immediately visible to their teachers and researchers. Taking a holistic view requires an understanding of the individual and here we review the impact of individual differences. Where there is difference such as disability or culture, we find that this dominates the experience for the individual, although not in ways that are stable or predictable. The individual difference which seems to have most importance is the combined influence of prior experience and attitudes towards using computers within learning.

5.2 The student experience of online supplementary course resources

> *We've never done any surveys, ever, that have given anything other than the students want more of it, wider and deeper.* (Longside1)

Studies which have measured student use of online resources show regular and frequent usage (Boyle et al., 2003; Dickinson, 2005; Codone, 2004; Hibberd, 2006; Nachmias and Segev, 2003). It appears that most students do choose to access resources that are made available to supplement their courses even when they are not required to do so. Molesworth (2004) was keen to find out the role of student choice in this. In a marketing course at Bournemouth University he was careful not to force students to use the supplementary resources through pressure from tutors or assessment. He reports that all students accessed the resources, posted at least one message and read several.

In an American study appropriately titled 'If you build it, will they come?' Cook, Cohen and Owsten (2003) undertook a detailed analysis of the log files from WebCT from the cohort of 444 students taking an introductory macroeconomics course. They noted high levels of activity with students active every day. Their detailed analysis showed that most logins were quick (60% of visits less than 1 min in length) and speculated that students were checking for new announcements or postings. It is likely that there are individual differences in usage hidden within these averages. For example, Boyle et al. (2003) report that their online environment was used extensively by 304 students, with an average of 418 accesses per students over the semester. However, this represents a variation between two students using the system just five times each and one student making 1469 visits.

There is a potential issue that the institutional surveys reviewed here have tended to be returned by self-selecting students with response rates of 5-14%. It is possible that the patterns of activity reported in them are from frequent users, indeed Haywood et al. (2004) purposively sampled high users. The exception is the Saunders and Pincas (2004) study which used a survey completed both online and face to face so as not to bias results in favour of those students who might be technologically competent. They found though that the results from the face to face completion supported the results of the online survey.

5.3 Flexible access from home and campus

> *"Being able to complete IT skills/website evaluation sessions from home and in my own time means that I can work when I want to. This means when I do come to sit down and do the tasks, I put in more effort and therefore obtain*

more benefit from the session than I would do under non-optional timetabled classes". (Student quoted in Weyers et al., 2004, p.14)

Saunders and Pincas (2004) found that full time undergraduate students at the University of Westminster reported spending an average of 14.5 hours studying outside the classroom each week, falling to 11.5 hours for part time students. This is clearly a significant amount of time over which students make choices about where and how to spend their time. In addition, they report that full time students are also working in paid employment for 5-40 hours a week (average 15). With such high demands on student time, it is unsurprising that students are taking advantage of the flexibility offered by technology to study at different times and places.

In their institutional VLE survey of 745 students, Weyers, Adamson and Murie (2004) asked students at the University of Dundee about flexibility. They reported that 91% of respondents agreed that the VLE enabled them to learn at a place and time of their own choosing. Similarly, an internal evaluation conducted at the University Deepshire reported that 91% of students learning a language in blended mode agreed with the statement that 'I liked the fact that I could access the on-line activities any time.' One student said:

"For me, it helped with the continuity in between face-to-face lessons in the classroom. I like the fact that every day, or whenever I felt like it, I could just go in and practice [sic]." (quoted in University of Deepshire internal evaluation, 2006, p.23)

This flexibility is demonstrated clearly in the times students choose to access their VLE. Reports of significant student use both day and night and weekdays and weekends are common (Dickinson, 2005; Haywood et al., 2004; Hibberd, 2006; Jones and Fitzgibbon, 2002; Lugeba and Williams, 2004; Molesworth, 2004; University of Eastonhall student evaluation of the VLE, 2004).

All surveys found that most students use a mixture of on and off campus computing facilities. Even where student computer ownership is high, there is still a strong dependence on university-provided computing facilities (Weyers et al., 2004). At the University of Wales, Bangor, Smart and Holyfield (2004) report that 79% of students used on campus computing labs and a similar number (72%) used home computers. Similarly, Eastonhall's VLE survey found that 73% of respondents accessed the VLE on campus and 65% accessed from off campus (University of Eastonhall, 2004). When asked to express a preference, students' top preference was for their own computer (62%) with a university computer as second choice (58%). It was noted that there was still a significant minority (30%) using a university computer as their first choice (Haywood et al., 2004). Gender differences in access have reduced over time although women are still more likely to report using a 'family resource' at home rather than their own computer (Kirkwood and Price, 2005).

As we might expect, facilitating flexible access is particularly important for multimedia implementations. Davies et al. (2005) evaluating a course which provided videos to physiotherapy students found out from focus groups that students appreciated having copies of the videos on CD-ROM so they could play and replay at home or on university facilities in their own time. Clark and James (2005) provided weekly online readings with questions to prompt discussions. Students preferred this way of accessing readings, saying they found textbooks expensive and libraries inconvenient.

Aspden and Helm (2004) from Sheffield Hallam University give us just a taste of an insight into the student experience behind all these statistics. Following a small number of students, they relate a story of a student living a considerable distance from the campus who only attended on days she had scheduled teaching time. Her log and diaries showed that she was using online facilities to plan her on campus time more effectively. Searching online meant that she spent less time on campus searching for information and more time interacting with peers. Considering the degree to which students are requesting and making use of flexible access, it would be worthwhile to conduct further research like this to give more idea of the reality of the student experience of flexible studying.

5.4 Access to course notes and note taking

> *"It makes it easier to take notes in class and so I tend to learn more when I only have to write down the extras instead of the basics as well."*
>
> (student quoted in Smart and Holyfield, 2004, p. 9)

This section summarises the findings of studies which have looked at the types of resources students are accessing in their frequent logons. From an educational viewpoint the provision of course notes and information is frequently played down as being 'transmissive' and not enhancing learning. In the USA, Caruso (2004) undertook a survey of nearly 4500 undergraduates, asking them about their experience of using IT in conjunction with their learning. Caruso reports that most use of technology by students was associated with VLEs. The benefits that students perceived around this use were to do with access to materials and readings rather than discussions and quizzes. She concludes that 'today's information technology use in instruction is primarily for convenience and not for the higher goals of improving learning' (pp 7-8).

Surveys in the UK show that students choose to access lecture notes when offered online supplementary resources and that they are overwhelming positive about it. Smart and Holyfield (2004) asked students what they used the VLE for. The top result was course documents (92%), course information (81%) and announcements (72%), to email tutor (40%), drop assignments (33%), quizzes (31%), follow external links (32%) and discussion boards (23%). When asked what they like about it, 41% said access to module document and information. Similarly, the University of Eastonhall (2004) reports in their VLE survey, that the main reasons students give for accessing the VLE is to obtain resources such as lecture notes (74%), followed by lecturer encouragement (66%), course management and administration e.g. calendars and announcements (60%), ease of use (53%), saving time (52%), ease of access to information (51%) and then assessment (28%), communication (19%), email (27%) and develop IT skills (24%). Metroville University (2004) asked students how useful they found a variety of activities on Blackboard. As with the other surveys, the top result is for lecture notes with 94.7% of students finding it useful or extremely useful to download lecture notes.

These findings are typical, however they could be influenced at least in part by what type of resources are made available to students. Asking a slightly different question, which did not rely on current provision, Haywood et al., (2004) purposively sampled 576 high WebCT users and asked them, in a free text response question, what activities and resources they would like to see more and less of. The students were clear that they wanted more information online in the form of lecture notes and presentations, information for learning, past exam papers and journals. A smaller

number of students, interestingly, wanted more quizzes and tests and discussion-communication or just more use of WebCT by courses.

When asked why they access lecture notes to such an extent, students report that they sometimes unavoidably miss sessions due to illness, family circumstances or employment commitments and it is useful to have the materials available to catch up.

> *"For some people who suffer from disabilities and have no choice but to take time out, it is an enormous benefit in order to keep up with what is happening in lectures and what areas to read up on. Brilliant!!!"*
>
> (student quote from University of Eastonhall VLE Survey, 2004, p.19)

Making lecture notes available before lectures reduces the disadvantages faced by students with disabilities, particularly where they are made available in a flexible format that allow for customisation (Ball and Campy, 2002). Indeed many students say that having the notes reduces their reliance on note taking and allows them to focus on the content of lectures (Codone, 2004; Smart and Holyfield, 2004). Grabe and Christopherson (2005) in an American paper, make a useful suggestion that what we should be doing is focusing more research on what *types* of notes we offer in this format. In their work they have tried outline notes made available before the lecture and full notes taken during class by a paid note taker and made available after. There is already a large literature on lecture notes from before the rise of the VLE which would be relevant here (see McMullin and Munro, 2003 for review). Given the positive student reaction to lecture notes, and the role of student feedback in quality assurance, it is likely that they are here to stay. It would be beneficial then to conduct research into the impact of different forms of notes and the times when they best support learning.

Clarke et al. (2005) in a study which was actually about multiple choice questions, found out about their students study patterns and attitudes to study from the focus groups. They explained that for students, lecture notes are a vitally important resource for study, indeed the lecture handout 'played a talismanic role in the students study process' (p. 258).

- Knowing how students feel about lecture notes, it is perhaps unsurprising that they make an effort to have and hold them. Many surveys reported student complaints about the time and expense associated with downloading and printing notes (Concannon et al., 2005; Haywood et al, 2004; University of Eastonhall VLE Survey, 2004; Weyers et al, 2004; Williams, 2002)
- "I strongly believe that students have enough of a hard time obtaining lecture notes, tutorial tasks set from [the VLE] just for one module. It's time consuming, costly and frustrating to have to print off lengthy documentation every week, documentation which could be made available to all students at the beginning of each semester*." (student quote in University of Eastonhall 2004b, p.34)*

5.5 Impact on patterns of attendance

Staff express a common concern that making lecture notes available will reduce attendance. The surveys of VLE use show that a minority of students are honest enough to admit that they are tempted to miss a few lectures because notes are there (Smart and Holyfield, 2004). More systematic studies confirm that attendance is

an issue and that the provision of online information plays a role in decision making for a minority of students. Newland (2004) in a study of the VLE at Durham University, reports that 2% of students state that having access to lecture notes in advance would be a reason for them not attending lectures. Matheos et al. (2005) report a much higher proportion of 26% of a cohort saying that they are less likely to attend lectures when notes are made available electronically.

The impact on attendance may increase as online provision becomes less about retrieving notes, and more about learning activities, attendance may fall more. Dickinson (2005) made extensive use of the VLE in a large accounting course. Online notes and resources were placed on the VLE, along with weekly questions for discussion and directed study tasks to complement the existing weekly lectures, workbook and fortnightly seminars. In an end of course survey the students were asked about their attendance in a question 'Do you think having extensive Blackboard support made you attend taught sessions more or less over the year?'. 67% of the 201 respondents reported that their attendance had not been affected, 23% attended less and 7% thought they had attended more.

O'Toole and Absalom (2003) in an Australian university noted that lecture attendance had dropped with the introduction of full text notes and recommended readings on the VLE. They state explicitly at the outset of the study that the results will inform what they do next, either to move towards virtual tutorials or remove the existing material from the internet and encourage attendance. They found that students who attended lectures outperformed all other groupings of students by about 20% in a surprise quiz in the last tutorial of term. They propose, not to require attendance, but to change the type of material provided to supplement the lecture. Rather than providing an alternative, independent study type of lecture alternative, they plan to use the web to prompt interaction e.g. through providing lecture summaries with questions.

Where attendance is considered essential, there are ways of tackling this. Stubbs, Martin and Endlar (2006) provided lecture slides on their VLE and expected students who missed an odd lecture to be able to use them. In addition, they rewarded regular lecture attendees with assignment hints and tips. They report that the face to face tutorials were characterised by more intense and in depth discussions as students got to grips with the fact that they needed to complete online problems to gain access to tutors and face to face support.

Scott (2004) distinguished between the value of attending lectures, where lectures were mirrored in online PowerPoint presentations and the study guide, and attendance at workshops. The value of attending workshops was confirmed by the tutor's reactions to non-attendance. Students were contacted by email if they did not attend asking them for their reasons for non-attendance and offering support. If they didn't respond they were followed up by phone or letter.

It is likely that lecture attendance is a more complex issue than the provision of notes. The findings previously reported on the amounts of paid employment students are undertaking, and the individual case studies, show that many students are organising complex lives around multiple commitments and concurrent modularised classes. The reality is that students will be choosing which sessions to attend. It is important that staff help set clear expectations to help students make informed and beneficial choices about attendance to best support their studies.

5.6 Inconsistency in use between staff and modules

> *"It was a useful source of information, so you could find out things like when things were due in or what to hand in. I could always find that… I could go on to Blackboard and have all the information at my fingertips… most of my courses are paper based, and I defy anyone not to lose bits of paper. It's very useful having it all online, tied together like that"*
>
> (student quoted in Durkin, 2003)

Students reported one of the benefits of supplementary course resources as having all the information together in a 'one stop shop' (Weyers et al., 2004; Codone, 2004) and that they would like all modules to have an online presence:

> "When we asked students if they had any other comments or suggestions, we were pleased to read that students' most common request was to have all their modules supported through Blackboard."
>
> (Papachristou, 2003, p.5).

However, they qualified this by saying that the one stop shop was only effective if all staff/modules used it in the same way and that lack of consistency made it difficult to know where and how often to look for new material. Disabled students, those with slow reading speeds or difficulties with organisation are particularly disadvantaged by inconsistent use:

> *"I think each one has a different layout of the order of the buttons and what actually is there, so I sit there for ages just looking, thinking which one do I want"*
>
> (ALERT student reported in Newland, Pavey & Boyd, no date)

Students report that different staff, modules and departments use different facilities as the official means of communication. These include VLE announcements, emails or noticeboards and students have to check them all (Smart and Holyfield, 2004; University of Eastonhall, 2004; Weyers et al., 2004). Both the University of Dundee and Longside have called for standardization on the basis of student feedback:

> *The pro Vice-Chancellor of teaching and learning is getting so annoyed with the students reporting to him that why don't all lecturers use the VLE, that he's issued this version of the minimum standards of use.* (Longside 4)

5.7 The student experience of blended courses redesigned to promote interaction and communication.

We have seen so far that the most common use of technology is the provision of course materials to supplement face to face teaching, usually through a VLE. It is clear from surveys of use and satisfaction, that students value having flexible access to course materials and do make use of such provision. For some students such as those with disabilities or those who are not able to attend all the face to face sessions this provision should enhance their learning experience. It is not clear that, on their own, provision of course information enhances learning for all, despite this often

being a primary rationale for the development of technology supported learning and the institutional adoptions of VLEs (Alexander, 1999; JISC, 2005a). It is more likely that enhancements will come from blends of face to face teaching with other types of technology supported learning *activities*. It is the evaluations of these types of blends which will inform how institutions develop their blended provision in the coming years.

It is clear that while students value face to face teaching and say that they do not want technology to replace it, they also recognise the benefits of the integration of the two (Enjelvin, 2005; Felix, 2001; Spicer and Stratford, 2001):

> In each evaluation over 5 semesters, a majority of students have consistently supported this blended approach suggesting they thought the two components were complementary and well integrated.
>
> (University of Deepshire internal evaluation, 2006, p. 20).

As outlined in Chapter 1, our aim is to give an insight into the lived experience of the learners in embedded and evaluated blended situations. Our intention is that our findings and recommendations are based on such practices in order to reduce the impact of extraneous variables such as innovative course leaders and exceptional online tutors. Our interest here is in how blended courses are experienced by students of the majority of staff, not students of the early adopters. Also, it was clear from our interviews that institutions felt that such evaluations were something that was missing from their own institutions (see Chapter 4). We have been selective about which studies to include and, as in previous chapters, have highlighted some of our key studies.

5.8 Experience of online communication and collaboration

The potential of communicative technologies is well established in the e-learning field (Laurillard, 1993). There is a large literature around computer mediated communications (CMC) and computer support collaborative learning (CSCL) that promotes the benefits of asynchronous text based discussions and makes recommendations on how to use online discussions effectively (e.g. McConnell, 2000, 2005; Salmon, 2002, 2004). CMC was one of the first uses of the technology and taken on board by early adopters who reported in their evaluations with undergraduates that students valued the flexibility of the asynchronous nature of online discussions and the chance to post detailed, reflective contributions (e.g. Boyle and Cook, 2001; Lockyer et al., 1999, 2001).

Higher education staff continue to try to use technology to promote communication but are not reporting the same consistently positive results. In the surveys of courses making use of multiple features of the VLE, discussions frequently appear as the part which is least used and valued by students (Ausburn, 2004; Dickinson, 2005; Molesworth, 2004) and as being something that is difficult to engage undergraduate students with (Metroville VLE report, 2004; O'Leary and Cai, 2004; Westington, 2003). Even in courses where discussion is well integrated into the course design, there are still reports of students having difficulties in making good use of both asynchronous and synchronous discussions (Clouder and Deepwell, 2004; Cox et al., 2004; Dron et al., 2004; Heinze and Proctor 2004), simply choosing not to use them (Grund et al., 2004) or choosing email over a discussion forum (Concannon et al, 2005; McHugo et al., 2004; Schmidt, 2005).

Specifically, there are difficulties with students engaging in the level of dialogue expected, especially where it requires giving feedback to peers or review and critique others' work (Kear, 2004). Clouder and Deepwell (2004) set up discussion forums for physiotherapy students while they were on placements. They were expected to note critical incidents, relay them on the discussion forum and comment on each other's in order to promote reflective learning. They found that most students did post but were not prepared to comment on each other's work. The staff observed that 'we were clearly trying to foster something novel and therefore uncomfortable to students'. Hughes and Daykin (2002) blended online group work with face to face teaching and found that students did critique each others' essays. However, what tended to happen was the stronger students posted first, and the rest of the group praised them. Like Clouder and Deepwell, they asked was this just because this was online, or because the students had never been asked to undertake this kind of activity before?

One of the SOLE case studies (O'Leary and Cai, 2004) demonstrated the lack of confidence that students feel with online work and saw this as distinct from general IT skills. The Economics case study reports that prior to the start of the module 92% of the 216 students were confident using the Internet and 95% were confident obtaining information from WebCT. In comparison, only 65% were confident taking part in online discussions and confidence in using discussions actually decreased by the end of the module. The SOLE case studies also identified genre confusion as a possible barrier to communicating online. It was noted that students and tutors were using different writing styles without any consistency or understanding of what was appropriate (Timmis et al., 2004a).

It has also been suggested that discussions are more difficult to achieve in undergraduate blended e-learning contexts because students have more opportunities to meet face to face (Ausburn, 2004) or that this generation of students are more familiar with synchronous communicative technologies like online chats and texting (Timmis et al., 2004a). Perhaps it is that the role of the tutor is so influential in online learning and whilst the first proponents of e-learning tutored well, the next tranche will need more training and support to develop their online tutoring skills (Dron et al., 2004). Russell (2003) found only about 10% of students participating in discussion forums to support a first year Fluid Mechanics and Thermodynamics module at the University of Hertfordshire and suggested this might be due to a lack of confidence of first year students in attributing their messages to themselves. He found that where students where allowed to adopt an alias, most of them chose to do so, particularly when they were starting a thread (asking a question) rather than responding to a previous posting.

A closer examination of studies which have sought out the student perspective shows large individual differences in the students' reactions to online communication (Flynn et al., 2005; Molesworth, 2004). Sweeney et al. (2004), working in Australia, evaluated student reactions to online collaborative groups. Some students appreciated the shift in emphasis from tutor led face to face discussions to more collaborative discussions with peers, others expected to have a model answer from the tutor and were frustrated when it didn't arrive. Some students appreciated that working online allowed more considered responses, whereas others expressed concern at the time needed to contribute effectively to online discussions.

Box 5.1

Communication as a challenge and an enabler on a part-time BSc in Information Technology at the University of Salford

In this redesigned blended course, students attended one evening session each week and were supported between sessions with online discussion based tasks. The discussion based activities were brought in to build a sense of community in the cohort with the aim of improving retention.

Data was collected, over a two year period, through interviews and focus groups with staff and students and analysis of messages on student discussion boards.

In the first year, the discussion based activities were based on Salmon's five step model, moving through progressively more complex tasks starting with a face to face induction session, an online icebreaker sharing prior experiences, and culminating in two assessed discussions around research papers. About a quarter of the 40 students participated in the introductory discussion and these were generally the students who engaged with the assessed discussion.

There were large individual differences in the use, perceptions and impact of the discussion activities. While some students were comfortable with the technology affording detailed and reflective posts, others felt daunted by the lengthy posts of their peers. For some, the impact was so severe it was citied in their reasons for withdrawal from the course:

"Due to recent events in my personal life and the frustration of not being able to connect to the internet at an earlier data, I have decided not to return to the course this year. I have already achieved [a qualification] but seeing what my fellow students were contributing online with all their experience in IT where mine is mainly educationally based, quite frankly, scared me and made me realise that I could be letting my 'team' down." (p.8)

In year two, the number of online communications expected were reduced. Students shared experiences online but completed their assessed work individually. The result was a loss of any sense of community in the group and drop outs remained the same as in previous years.

Heinze and Proctor (2004)

Ellis and Calvo (2004) have attempted to explain such individual differences in a phenomenographic study. They gave questionnaires designed to assess approaches to and conceptions of learning to Australian students on a blended e-commerce course. They found that 'students who conceive of discussions as a useful way of learning about the subject tend to engage in online discussions in a reflective and meaningful way' (p. 272). Students with such conceptions of learning were able to adapt their approaches dependent on the medium. In face to face discussions they emphasised learning through the experience of others, in the online part of the course, their approach emphasised reflecting on problems discussed from a variety of perspectives. It is possible that how students conceive of their own learning could be a crucial factor in predicting their success in blended learning environments. Students who have a good understanding of their role and the tutor's role may be less likely to suffer from frustrations of communicating online. However, Goodyear et al. (2003) report no differences in networked learning experiences which could be attributed to conceptions of or approaches to studying.

5.9 Experience of classroom communication systems

Technology has also been used, in quite a different way, to improve communication in the classroom through the use of electronic voting systems (also known as personal or audience response systems) (Banks, 2006; Draper and Brown, 2004; Judson and Sawada, 2002; Simpson and Oliver, 2002).

Boyle and Nicol (2003) used a voting system to promote in-class discussion in the engineering department at the University of Strathclyde. Students were presented with multiple choice questions and give their answers via their handsets. The responses are immediately collated and presented back on screen. In this case study the answers given by the group were used to promote in-class discussion as students defend their answers and challenge others. Feedback was collected from the students for the evaluation through focus groups, in-class critical incident questionnaires and a Likert scale survey completed at the course end. The majority of students (74%) agreed that the teaching methods were more effective than other classes in helping them understand engineering concepts. Interestingly, in relation to the previous discussion about understanding their own learning, students in the focus groups attributed their learning to being active in class, having time to think and reflect in class (not take notes) and discussion with their peers in class. Over half the students reported that knowing that they might be asked to explain the thinking behind their answer encouraged them to formulate their explanations. It seems that the way the technology has been integrated into the class and explained to the students has helped them reach a sophisticated and beneficial understanding of their role in their own learning.

As with online communication, a more complex picture of mixed student reactions emerges from a review of literature on electronic voting systems with student groups providing a mixture of supportive and sceptical comments (Simpson and Oliver, forthcoming).

5.10 Experience of interaction with content

The studies in this section report on courses which blended face to face with technology supported interaction with content. This particular type of blend often stems from the teaching of complex or unfamiliar topics which students find particularly problematic.

Introductory programming has been identified as one of these difficult topics (Sayers, Nicell and Hagan, 2004; Scott, 2004). The case study in Box 5.2 offers one possible solution through the creation and use of learning objects. This example highlights the course redesign as a critical success factor. Whilst outside the scope of this review, there is a large and growing literature on the development, use and reuse of learning objects such as the ones developed for this case study (see for example Littlejohn, 2003; Koper et al., 2004). The challenges for the wide scale use of learning objects include their integration into VLEs and the changes to staff practices around curriculum development.

Box 5.2

A redesigned blended course for introductory programming at London Metropolitan University and University of Bolton

The introductory programming courses were redesigned to support the learning of difficult topics through interaction with learning objects. This was in response to poor pass rates and a 50% increase in class sizes. Animated and textual learning aids were developed to demonstrate some programming constructs or operations.

The course retained lectures and computer labs as contact with subject experts and explanation of some theoretical topics. Between each session, students were expected to use the learning aids to help them complete the weekly task sheets. In the first half of the semester, students used a specially created graphics library which allowed them to construct simple programs that produced and manipulated simple shapes. This basic design was delivered on three modules at two institutions affecting about 600 students in total.

The course was evaluated using student questionnaires at various points during the course as well as recording final grades.

The mid point questionnaire was significant as this is often the point where some students are not progressing well and show low motivation. Although 22% did report being disappointed with their progress, they were better motivated at this point than usual and able to keep working. Pass rates increased by 12-23% on the previous year in the modules which followed this blended approach.

Boyle et al (2003) and Boyle (2005)

Holbrook and Devonshire (2005) designed computer aided tutorials to simulate scientific thinking and facilitate understanding of abstract concepts for Australian students studying atmospheric science and oceanography. Again the authors report the importance of course redesign and particularly of constructive alignment of learning objectives, learning process and assessment tasks. Staff perceived that students engaged with the task 'at a more rigorous and deeper level' (p.209) and overall student performance was better for this task than for other assessed tasks in the course.

Boyle et al. (2003) noted in their study in Box 5.2 that there was a wide variation in students' responses to their preferred learning aid (lecture, text aid, graphic aid) with the only common theme being the unpopularity of the text book. Brown and Leidholm (2004) also found that students demonstrated individual differences in their preferred choice of format. Having provided students with a variety of formats including textbook, PowerPoint slides, streaming video and quizzes, they found that each course resource was preferred as the first point of contact with the subject matter for at least some of the students.

5.11 Experience of online assessment and feedback

As mentioned in Chapter 4, there is evidence of correlations between the introduction of online assessment and improvements in learning outcomes and exam performance (Clarke et al, 2004; Morris and Walker, 2006; Russell and Bullen, 2005), at least for those students who use it (Catley, 2004). There is also evidence from embedded studies that making at least some part of the assessment summative is a useful way of encouraging student use (Enjelvin, 2005; Meredith and Newton, 2004).

The reason that computer aided assessment (CAA) improves outcomes is that it offers students timely feedback to support their learning. Students often request feedback and so CAA implementations typically show very high levels of student satisfaction.

> *"Computer aided assessment is definitely a good revision and learning tool. It shows where you are going wrong and teaches you to think for yourself, and also shows you the areas that need more revision. It makes things stick in your head for future reference."*
>
> (student quote in Morris & Walker, 2006, p.4)

Perhaps because of the relative success of computer aided assessment, in comparison to say online discussions, there is scant literature on how learners experience online assessments. Studies of the learner experience have shown the spacing of tests does encourage students to work more consistently across a course, and, as suspected, students sometimes converge in computer labs to take online assessments (Concannon et al., 2005) which, depending on the status of the assessment could be seen as peer learning or cheating.

Some practitioners have modified computer aided assessments to reduce the opportunities for plagiarism. Ellem and McLaughlin (2005) made quizzes available for one week and students were only allowed one attempt. They found that students were sitting together to take quizzes, or passing on the questions to other people. In their second year of implementation, they deterred plagiarism with fairly simple changes: the quizzes were only available for an hour and presented randomized questions from a dataset. Russell and Bullen (2005) developed student unique tutorial sheets for use in engineering courses. Students are then free to collaborate on the method, but their data is different and so their answers will be different.

Clarke et al. (2005) reports on a pilot of making multiple choice questions available online or in print. Usage was purely formative and low. During focus groups, students were asked about their reasons for using the quizzes. The authors state that "The lack of repeated use of the quizzes was largely due to the difficulty students had in perceiving how they would form a cemented part of their studies, as it did not fit into the rigorous essay writing and examination process" (p.255). Again, we are seeing here that it is students' understanding of their learning, and their role within that, that influences their behaviour.

Technology supported assessment does not have to use automated responses. Scott (2004) describes a course redesign at University College Chester on an introductory programming course. In response to poor student performance, the plan was for students to submit their workshop tasks by email to the course tutors in the early weeks of the course. Tutors made a commitment to provide feedback within 12 hours of receipt. Although this required some dedicated time set aside, the tutors did note that they did not have to arrange the number of individual tutorials they usually would with students having difficulties. As the course progressed, students and tutors continued to communicate efficiently and conveniently via email.

There have been a number of recent reviews of computer aided assessment which raised issues about its uptake and integration in higher education (Conole and Warburton, 2005; Sim, Holifield and Brown, 2004) and the challenge of developing standards compliant assessment content for delivery across different VLEs (Sclater and MacDonald, 2004).

5.12 The student experience of emerging technologies

Blended e-learning will increasingly include the use of student owned technology such as laptops, personal digital assistants, mobile phones, personal digital audio/video players and tools that cut across course boundaries such as e-portfolios. However, these are not yet mainstream.

It is already the case that UK undergraduates own and make use of their own computers. Undergraduate students in the UK already report a high level of ownership and use of technology. Computer ownership has risen sharply from 52% in 1999 (Breen et al., 2001) to a level close to saturation of over 90% at the University of Dundee (Weyers et al, 2004). Of these, an increasing number are laptops. Breen et al. noted that laptop ownership doubled between 1997 and 1999 and more recently Haywood et al. (2004) found that 56% of students owned laptops compared to 35% choosing desktop machines. In addition 60% have an Internet connection at home (Weyers et al., 2004) and 72% have used the Internet before coming to university (Saunders and Pincas, 2004). Students are using these computers for course related study. Haywood et al (2004) asked students about their use of computers for university studies and report that 87% spend more than 3 hours a week and an additional 21% spend 10 or more hours using their computers for university studies. The main uses of these computers are to research and create assignments (including accessing library resources) and to download lecture notes.

We could find very few studies about emerging technologies which met the inclusion criteria explained in Chapter 1. Where we did find studies, we felt that they did not satisfy the inclusion criteria we had adopted, in that they weren't yet able to tell us much about the student experience of embedded implementatins. For example, e-portfolios are an emerging technology which aims to provide a tool to encourage students to view their learning within different contexts in a holistic way. Currently there is very little information available on the undergraduate experience of e-portfolios as part of blended experience in UK higher education, although there is work emerging in FE and postgraduate contexts as part of the Enhancing Learner Progression (ELP) project (Higgison et al, 2006). Tosh et al. (2005) report on data collected from students at two Canadian institutions. 78% of students had not used an e-portfolio before and needed to see examples and hear about its value before they were convinced. Students had difficulty interpreting what was needed in the reflective commentaries and felt they put in more time than was recognised in the proportion of assessment marks allocated to the task. Much of this feedback has been heard at some time or other about an innovation and is likely to relate to the novelty of the situation. We await evaluations of embedded examples of the use of emerging technologies such as from the ELP and MyWorld portfolio project (JISC, 2005c).

5.13 The holistic experience of blended e-learning

The third broad characterisation of blended e-learning introduced in Chapter 2 is a holistic view of the student experience of blended e-learning where the focus is not on a particular technology, like the VLE, or the experience of studying a particular course. Studies reviewed in this final section have examined the experience from the viewpoint of the learner and some have attempted to identify the impact of individual differences on the student experience.

Box 5. 3

The experience of blended learning at Sheffield Hallam University

Researchers at Sheffield Hallam University have been conducting detailed, qualitative studies into the experiences of individual students who are taking four or more courses which make use of the institutional VLE.

Nine students kept diaries and logs for two weeks and were then interviewed.

Maintaining a connection with the university is a recurring theme in the student diaries and the virtual presence of the VLE facilitates the connection between the student and the university when students are off campus for employment or placements.

"I have contact with the university even though I am not there." (p.249)

Students felt that connections with the institution could be damaged by a number of reasons such as non-attentiveness of staff, timetabling changes, repetition of content in sessions. In the blended environments, students were able to exploit opportunities to maintain the connection such as by interacting with peers or preparing for the next session. The authors suggest that maintaining this connection could be an important factor in student retention.

Aspden and Helm (2004)

It is worth noting that attempts to determine the relative importance of different individual differences are enormously complex. Concannon et al. (2005) reports that she was interested in acceptance or rejection of technology at the individual level but found it difficult to draw out themes because of lack of consistency between *or even within* individuals. In a previous review of e-learning in post-16 sectors (Sharpe et al., 2005; Sharpe and Benfield, 2005) we examined individual differences that might impact on the learner experience and concluded by characterising those learners who were effective in e-learning environments as those who could: cope with the emotionality of the experience, reconstruct their approaches to time management and develop the necessary e-learning skills.

The subsequent Learner Experience of E-learning (LEX) study interviewed 55 learners from all sectors of post-16 education and analysed the interviews using interpretative phenomenological analysis which allowed the themes to emerge solely from the students views and words. They suggested that those who will learn well in an e-learning context display

> confidence in their ability to cope with life, learning and technology; the capacity to network with others through a variety of communication channels; highly effective time management skills; and most crucially, the skill to integrate and balance learning with work, leisure and family commitments are key.
>
> (Creanor et al., 2006b, p.9)

5.14 International students

Most of the literature on international students' experiences of blended e-learning comes from the USA and Australia and from studies which have tracked student behaviour in online environments. These have observed that Chinese students post fewer messages than Australian students, particularly when they moved on from socialisation to making intellectual contributions to the debate (Smith, Coldwell et al., 2005) and that Chinese students posted more conservative and less critical postings than American students (Thompson and Ku, 2005).

We were not able to identify any UK studies which set out to explore the experiences of undergraduate international students in blended e-learning environments, although one of the SOLE case studies noted that although overall participation in discussions was low, it was higher for students whose first language was not English:

> *"I think almost everything was easier with WebCT, because my mother language is Finnish… so it is much easier to read everything and get new information."* (student quote in O'Leary and Cai, 2004, p. 9)

Thompson and Ku (2005) give some insight into the experience in a well designed study of Chinese graduate students in the USA. Although this study does not meet our inclusion criteria, because of the paucity of similar UK studies of undergraduates we have included it. The experiences of seven Chinese students were explored while they were taking a VLE based course whilst studying on campus. They used multiple data collection methods: interviews with the students and their tutors, focus groups, and analysis of message transcripts. Language was mainly seen as a difficulty. Some students found writing in English daunting and time consuming. They worried about spelling and grammatical errors and used dictionaries and friends as proof readers intensively. Other students felt more comfortable expressing their opinions online than face to face:

> *"In the online environment, I can say whatever I want. They don't know who I am or what I look like so I don't feel so embarrassed."* (Thompson and Ku, 2005, p.41)

Thompson and Ku conclude that no two Chinese students' experiences are the same.

5.15 Gender

While there has been a great deal of interest in the different behaviour of males and females in fully online discussions, many studies of mainstream blended e-learning environments report no significant gender differences (Haywood et al., 2004; Atkinson, 2004; Fletcher, 2005).

Gunn et al. (2002) provide a useful reflection on the gender issues on a variety of blended courses and institutions. They report a closing gap over time in gender differences in computer ownership, confidence, and expectations of use. Indeed both this article and McSporran and Young (2001) suggest that women may outperform men in blended environments because they are better at scheduling their time. There was evidence that men had lower participation, not just on discussions, but also on quiz attempts, viewing of web pages and assignment submissions.

5.16 Disability

We saw in the previous section on VLE use that disabled students are positive about the provision of supplementary course information. They report the benefits as catching up when they have to unavoidably miss sessions, having materials available in flexible formats, and reduced emphasis on note taking in class (University of Eastonhall, 2004; Smart and Holyfield, 2004).

Some disabled students also experience the anonymity of online interactions positively e.g.:

> *"Nobody online had to know that I had a disability, whereas in a classroom environment it stands out like a sore thumb."*
>
> (student quote in Creanor et al., 2006, p.5)

Some disabled students also point to difficulties with work in a blended environment. As with other classifications of individual differences, these are highly specific and contextualised. For example, Hughes and Lewis (2003), relate the experience of dyslexic student as they tried to complete a time online test:

> *"I had no problems with the concept, the problem that I did have was that it was timed. You don't try and put dyslexics under a timed environment because they don't perform and when you've only got a minute to answer a question, although it's only a tick box and you have to pick, say, one out of three, one out of two, one out of five… with us, we're trying to get our head around what they're on about for a start – well that's 45 seconds gone … I don't like it, it's unfair and it disadvantages people."* (p.12)

The ALERT project makes recommendations for supporting students with course notes which would seem to be of benefit to many students, not just those with disabilities (Newland et al, no date). This view of an inclusive approach that takes into account the needs of all learners is growing in popularity (see for example Draffan and Rainger, 2006; Lessner and DeCicco, 2006; Phipps and Kelly, 2006).

5.17 Learning style

Although there has been a good deal of research, particularly in the USA, attempting to find links between students' use of technology and their learning styles, recent reviews of this research have raised serious questions about its validity and relevance to practitioners (Coffield et al., 2004a, 2004b; Mayes, 2004).

What we can learn from studies of the student experience is that learners do interact with blended courses in many different ways. For example, Brown and Leidholm (2004) found differences between individuals in their choice of entry points to learning materials. It is not clear that these reflect any predictable or stable constructs. Indeed Concannon et al. (2005) remind us of the variation not just between but also *within* learners. We suggest that our energy would be more usefully focused on developing environments in which all learners are encouraged to learn actively and deeply. As Goodyear et al. (2003) report, having found no differences in the networked learning experiences which could be attributed to conceptions of or approaches to studying:

> A practical implication of this study is that it is reasonable to expect all students to have positive experiences on wel-designed and well-managed networked learning courses – not just those students with more sophisticated conceptions of learning or deep approaches to study. (p.17)

5.18 Experience of and attitudes towards technology

There is evidence that both prior experience and attitudes influence students' experiences of blended learning.

In terms of computing experience, the usual finding is that this is an advantage. Students have commented that slow typing speeds disadvantaged them while taking online quizzes (Davies et al., 2005) and in synchronous chats (Carr et al., 2004) and IT skills impacted on their use of Computer Aided Learning (CAL) (Atkinson, 2004). Where IT skills are already high these differences become less influential and here Concannon et al (2005) report that attitudes are more important than experience. Accounting students who held positive attitudes towards computers were more able to locate and make use of online resources. It is highly probable that experience and attitude are linked. In a rare longitudinal study, Arbaugh (2004) reports that student attitudes towards online working become more positive as they took more online courses.

In the future, student experiences are likely to be greatly influenced by the prior exposure to technology of the 'net generation' and there is work underway to explore the impact of this on learners and their learning (see for example Oblinger and Oblinger, 2005). A quote from an undergraduate Business School learner from the LEX study illustrates the ubiquity and integration of technology for some students.

> "it's the first thing I turn on in the morning before I even wake up … I think in future people can't cope without their laptops. My main use of it is I guess social networking. It would be MySpace and Messenger and e-mail things like that.." (Creanor et al., 2006b, p.13)

The use of technology for social networking is a feature of technology use that is being observed in school children who will become the higher education students of the future (Kent and Facer, 2004). The rise in the use of computers at home, for social networking is likely to deepen any digital divide. Kirkwood and Price (2005) suggest that it will be increasingly important for institutions to monitor rather than assume their incoming students prior experience, particularly where they have a rationale concerned with widening participation.

6 Conclusions and recommendations

Technology use has now become so prevalent in the lives of undergraduates that decisions about whether to use technology or not no longer seem relevant. The pertinent questions now are around *how* we should use, and evaluate the use of, technology. This illustrates a maturing of the design and application of blended e-learning. In previous chapters we have explored some of the choices being faced by higher education staff in the discussion of the dimensions of blended learning, reasons for blending technology with face to face teaching, monitoring and evaluating technology use and enhancing the learner experience.

As staff are called upon to build blended e-learning environments, design activities and tutor and support students through them, it will become increasingly important that we have evidence on which to draw as we make these decisions. There are already recommendations that will inform our decision making such as the work on the affordances of media (Laurillard, 1993), the burgeoning field of design for learning (see Beetham and Sharpe, forthcoming) and strategies for online tutors (Salmon, 2002; 2004). We hope that the review of learner experiences in Chapter 5 will complement these and encourage higher education institutions to move from an 'inside out' approach where those on the inside know what is best, to an 'outside in' position where we research and evaluate students' perceptions and attitudes to learning (Lea, Stephenson and Troy, 2003) and use them to inform our decision making.

As Garrison and Anderson advise:

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

We have argued throughout this review that we need to understand the impact technology use is having on the learner experience in order to make these decisions about the application of technology and to inform the development the new pedagogies.

6.1 Critical success factors for blended e-learning

The final research question concerned the success factors for blended e-learning. Institutions were asked to identify any success factors at the end of their interview (see Appendix 3). Although some interviewees interpreted this question as success in embedding blended e-learning into their institution, this is not our interest here and it has been investigated elsewhere (e.g. Beetham, 2001; Bricheno et al, 2004; Normand and Littlejohn, 2006). Our interest is in the factors that may lead blended e-learning implementations to be effective at the level of the institution, the course, its tutors and importantly, the learners. The following factors emerged as being critical to the success of blended e-learning in practice.

6.2 Use the term 'blended learning'

We found in Chapter 2 that although the term 'blended learning' may be difficult to define, it is gaining in acceptance. Here we go further to suggest that the using the term may in itself be important to the success of blended implementations of e-learning. The lack of a consistent definition may be part of the term's strength as it allows staff to negotiate their own meaning for it within the context of their institution, course or student group. In terms of the dimensions of blended e-learning, protecting face to face teaching, designing for active learning and responding to institutional context, are all features of effective implementations.

6.3 Work with and within your context

In Chapter 3 we found that institutions that we had identified as successful implementers of blended e-learning had highly contextualised and specific rationales for their adoption. The issue of contextualisation was also identified in the interviews. Deepshire identified "school-based adoption strategy rather than a blanket central strategy" as a critical success factor and went on to clarify the importance of working in a way that is appropriate for each institution's context

> *"it does seem sometimes you look at other universities with a much stronger top down influence maybe you could get more done. But having said that you live with the institution you're in, you have to understand that culture and work with it as best you can" (Deepshire 2)*

It may be that this is related to the well established finding of the importance of visionary people in institutional change. Charlier et al. (2004), synthesising the learning from institutions involved in the EQUEL project noted that visionary people were crucial at the beginning, inception stages of innovative processes in higher education, but we do not yet know enough about the visions of these people. Perhaps they are highly contextualised visions. Similarly, we found that many course specific rationales were contextualised by practical teaching problems driven by large groups, the characteristics of the student group and/or demands of professional bodies.

6.4 Use blended learning as a driver for transformative course redesign

The importance of transformative course level designs was identified in Chapter 2 as one of three characterisations of blended e-learning. Throughout the review, studies repeatedly identified engaging in course design or redesign as critical to their success. This was particularly notable where studies described a blended course which had been developed in response to a real and relevant problem at the course level. Within the discipline of e-learning, the importance of designing teaching strategies appropriate to technologies has long been recognised (e.g. Ehrmann, 2003). It is reassuring to see this emphasis on course design being expressed by practitioners based on their real experiences.

Most helpful are those studies which have described what their course design actually involved. From these the valuable features of the course design appear to be:

- Undertaking an analysis of the successful and less successful features of the current course, including student feedback (Boyle, 2005). For example, Morris and Walker (2006) was one of the few studies which engaged in an honest appraisal of the current course identifying problems and targeting their use of technology in response to this (see Box 3.3).
- Undertaking the design as a team, ensuring that staff have the time to properly integrate face to face and online material (Aycock, Garnham and Kaleta, 2002) such as by allowing staff to develop only part of a module in depth (Boyle et al., 2003).
- Designs which make explicit their underlying principles. As discussed in Chapter 3, these might be based on established pedagogical principles e.g. being sensitive to the needs of learners as individuals (Graff, 2003), active learning (Hinterberger, Fassler and Bauer-Messmer, 2004), repetition and elaboration (Boyle et al., 2003), the requirement for prompt and frequent feedback (Morris and Walker, 2006) or design principles related to the course outcomes e.g. 'attention to detail' (Stubbs, Martin and Endlar, 2006).
- Developing the course iteratively over a number of years. We started the review looking for studies which were not reports of initial innovations (see Chapter 1). The studies which discussed course design as a success factor suggest that as many as three or four iterations of course design, development and implementation may be needed to complete the transition from traditional to blended e-learning course (Trevitt, 2005; Danchak and Huguet, 2004; Ellem and McLaughlin, 2005)

6.5 Help students develop their conceptions of the learning process

In Chapter 5 a common theme emerged from the studies of the learner experience that it seems to be important that students understand the role of technology in their learning and the implications for their study strategies and engagement in learning activities. We have seen that students vary in how they conceive of their own, and their tutors, roles in the learning process and this may be critical to their success. In order to support students through this, it is vital that we are consistent and transparent in communicating our expectations to students whether this is about for instance, revised attendance patterns or how to engage in purposeful dialogue in asynchronous discussions.

6.6 Disseminate and communicate results of evaluations

The need to promote and disseminate results from evaluations was identified as a crucial aspect of institutional monitoring strategies in Chapter 4. When asked about critical success factors, three institutions suggested issues around communication.

The implementation of blended e-learning at Kilderhill has had an emphasis on communication and collaboration and they have worked to promote and sustain a supportive community.

> *"A success factor is that we do have a nurturing community who do help each other, whether it's between academics, and academics and support staff, and they all trust each other." (Kilderhill 3)*

Kilderhill highlighted the importance of maintaining communications between schools in a devolved institution and described communication in terms of networks of practitioners.

> *" it's about making sure that the right people are talking to each other obviously. And it's absolutely crucial if we're going to be successful. And just the fact that people are communicating in this way is for us a very important factor of success" (Kilderhill 3)*

At other institutions, communication was described as being largely dependent on a single individual:

> *"I think for me it's the uptake in two schools and being able to report back on that through university committees, things like learning teaching and assessment conference, and staff seeing where some of .. the other schools were going" (Eastonhall 1)*

> *"From my perspective I think … it's maybe just where I sit, it's actually being in a position where you can co-ordinate all of these areas…….being able to see the connections between PDP and BlackBoard and their electronic portfolios, and diagnostic assessment. And that's partly happened only because I've only recently moved into this role from various other roles around the university, and then having the time to be able to link these things together." (Metroville 1)*

6.7 Recommendations for policy and practice

It is clear from the uptake of technology by institutions, the rise in the use of the term blended learning and the number of evaluative studies identified in this review, that many institutions and practitioners are attempting to engage with blended learning and are doing so successfully.

The following recommendations highlight issues which institutions in our sample, and published practitioners and researchers have themselves identified as being important to the institution:

- Terminology is value laden and worthy of negotiation at the institutional level
- Institutional rationales for blended e-learning should be contextualised and specific
- There is a need for more systematic institutional monitoring and evaluation of blended e-learning
- Establish institutional systems for dissemination of good practice, such as internal conferences and journals. Such systems need to be complemented by less formal, social dissemination practices. Institutions should attempt to establish and nurture communities of e-learning developers and practitioners to act as social repositories and disseminators of case studies of institutional practice.
- Staff need support in designing blended courses for diverse groups with a focus on whole course redesign to embed the innovations of individuals.

The purpose of eliciting and highlighting the learner experience of blended e-learning is to improve that experience for our future learners. It is clear that students need support in learning effectively in technology rich blended courses. This might mean

for example advice on managing their time during courses that mix timetabled sessions and independent study and/or developing skills to access and evaluate online resources. Much of this will be specific to the particular blend or use of technology. There are however some recommendations arising from the studies of learner experience which are likely to be more generally applicable to practitioners at the course level:

- The standardization of courses supplemented by online resources including consistent expectations about how students will be contacted, what materials are provided in print, when materials will be made available, in what formats etc.
- The provision of course notes, prior to lectures and in formats which students can customise, with more advice and guidance on how to personalise electronic materials.
- Clear expectations and guidance for students in structuring their study time and making good choices about attendance.

6.8 Recommendations for future research

- We have also made recommendations for future research in the following areas
- Considering the degree to which students are requesting and making use of flexible access, it would be worthwhile to conduct further research into the reality of the student experience of flexible studying.
- Given the positive student reaction to lecture notes, and the role of student feedback in quality assurance, it is likely that they are here to stay. It would be beneficial to conduct research into the impact of different forms of notes and the times when they best support learning.
- There is very little research which follows the learner experience of blended e-learning over time, such as over a whole degree programme.
- More purposive sampling of specific groups which are currently under represented in the literature, including disabled, mature, working, part-time, and international students
- We suggested that student conceptions of the learning process and their role within in it could be crucial to their experience, and suggest further research in this area.

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7 Appendices

7.1 Appendix 1 - EndNote keywords v 4.6

Please add to these as you see fit. But as you do add terms please update this document and distribute it to other team members.

Section	Keywords
Background	Student evaluations
	Literature reviews
RQ1:Use of term 'blended'	blend: definition
	delivery
	technology
	locus
	pedagogy
	chronology
	roles
	focus
	learning
	polity
	blend: vignette
	blend: VLE
RQ2: Rationale/drivers	Institutional rationale:
	Widening participation
	Enhancing learning
	IT literacy/ 21st century learners
	ROI/efficiency
	Competitive advantage
	New markets
	Employability

		Retention
		City/regional focus
		Part-time
		Mature learners
		Flexibility
	Local rationale	
		Large classes
		Higher order thinking/critical thinking
		Theory-practice gap
		Flexibility
		Computer literacy
	Approach to learning	
		associative
		constructivist
		situative
RQ3: Evaluation & monitoring	Institutional evaluation	
	Course/module evaluation	
	Methodology	
		Comparative
		ethnography
		survey
		Focus groups
		Diary/log
		Usage log
		Interviews: students
		Interviews: staff

	Message analysis
RQ3: Institutional change management	Organisational change
	Culture
	Disciplines
	Leadership
	Knowledge management
	Complexity
	Benchmarking
	Quality assurance
	Curriculum teams
	Practitioners' roles (e.g. learning technologists, eL champions
	Research led teaching
	Technology
RQ4: learner experience	Mode of engagement
	Access to information (mode 1: lecture notes online)
	Communication (cmc, discussion)
	Collaboration (groupwork, problem based learning)
	Interaction with content (e.g. authentic tasks, computer-aided practicals, PRS, simulations, video
	Higher order thinking skills
	Assessment & feedback
	Recording achievement (e-portfolios,
	Learner difference/needs:
	Age
	discipline based
	learning styles

		differentiation
		disability
		culture/international students
		gender
		anxiety/technophobia
		self-efficacy
		prior experience
		net generation
	Access	
		Home computing
		Wireless
		mobile
	Learner reported experience	
		Holistic experience
		Time
		Connection with institution
		emotion
	Effective learner dimension	
		Self-management
		self-regulation
		information literacy
		retention
	Learning outcomes/ Impact on learning outcomes	
RQ5: Success factors	Course redesign	
		RLOs
	Structure	
		(the need for clear structure and expectations e.g. stubbs, ellems hurdle assessments)

Task based design?

Pedagogical effectiveness

Implementation

Interaction (student-student or student-tutor)

Staff attitudes

Technical infrastructure

Support systems

Internal collaboration

7.2 Appendix 2 - Example of application of inclusion criteria

M. Bracher, R. Cullier, R. Ottewill and K. Shephard (2005) Accessing and engaging with video streams for educational purposes: experiences, issues and concerns. ALT-J, Research in Learning Technology, 13 (2) 139-150

7.3 Abstract

Video streaming has the potential to offer tutors a more flexible and accessible means of incorporating moving images into learning resources for their students than conventional video. Consideration is given to this assertion by drawing upon the experiences of staff and evidence from students at the University of Southampton in the use of a video, Back Care for Health Professionals, before and after it was streamed. The resulting case study highlights various issues and concerns, both logistical and pedagogic. These include ease of access, the form and frequency of guidance with respect to technical matters, the use of multiple channels of communication to convey key messages about the availability and value of the video, and the provision of demonstrations or 'tasters'. In other words, what some might regard as the 'softer' aspects of technological developments should receive at least as much attention as the 'harder'.

Inclusion criteria	**Evidence of being met**	**Score,** **1 = fully met,** **2 = partly met,** **3 = not at all**
Date	Data from 02/03 and 03/04	1
Blended scenario	Video made available to supplement f2f course	1
Undergraduate	1st year allied health professionals u/g	1
Embedded	2yrs data. In first year video as VHS, in 2nd year streamed	1
Student experience	Through questionnaires. And importantly, lots of data from students who hadn't accessed the video explaining why not. e.g. "I will definately make use of it, but need 'encouragement' to watch it in my own time. I will be more than happy to watch it in lecture times, if it's that important that we watch it." (p.147)	1

Representative	University of Southampton, traditional with online resources	1
Thorough evaluation	Just a survey. 119/150 (79%) completed survey, of whom 31 had watched the video.	2
Pedagogical rationale	Based on Laurillard. Laurillard describes video as a narrative medium that does not easily support active learning, but when delivered through a computer it 'inherits expectations of interactivity'.	1
Keywords	MoE Interaction with content video course evaluation local rationale: flexibility time access	

7.4 Appendix 3 - Semi-structured Interview Schedule

Pre-interview

Make sure the **Participant Information Sheet** has been given to the participant(s) and that they have signed the **Consent Form**. Ensure that any documents/artefacts that will be referred to during the interview will be available/accessible at that time.

Ice-breakers

- Introduce yourself
- Thank the interviewee for taking part
- Confirm the length of the interview & their availability for that time
- Provide a short overview of the aims of the project
- Explain how information from the interview might be disseminated

The following questions and prompts are for guidance only. They should be treated flexibly by the interviewer depending on the institution, the context of the person being interviewed and the specific institutional documents and policies that are the subject of the interview.

Use of the term 'blended learning'	**Notes**
How do you **define** 'blended learning' in your institution? • what are the most important features of this definition to you? • why did you adopt this as your definition? • what made you choose the term 'blended'? • what is the impact of using this term? • what documents/policies/web sites use this term? • who made the policy to use the term?	
Institutional blended/e-learning strategy	
What is your institution's **rationale** for adopting blended learning/e-learning?	Refer to institutional e-learning strategy

• what outcomes are you looking for?	statement
• what features of this are specific to your institution?	
• what are the key drivers for your institution?	
• what indicators are you using to measure progress?	
What incentives are you using to achieve these outcomes?	
• would these approaches work in other institutions?	
• are any of these approaches highly specific to this institution?	
• who are the institution's key players/champions?	
Have students affected the shape of your institution's policy in any way?	
• how?	
• when was that?	
• what about in future?	
How do you monitor implementation of your blended/e-learning strategy?	
• who monitors your e-learning strategy?	
• how is progress reported?	
• to whom?	
• with what regularity?	
What changes have you made to university quality systems?	Ask for permission to see internal documents related to these
• how do you manage quality assurance	
• how do you manage quality enhancement?	
• how is blended learning reflected in course validation processes?	
• how is blended learning reflected in course renewal processes?	
Evaluation and monitoring	
What evidence do you have about how students experience blended learning at this institution?	are there documents or other artefacts we can examine as
• how have you gathered information about the student	

experience of e-learning? evidence of this?

- What have you found to be the **impact** of blended learning on the student experience?

What evidence do you have of the effectiveness of blended/e-learning? Ask for permission to see internal documents related to these, e.g. internal case studies, VLE survey data, etc

- what measures of effectiveness do you use/value?
- what measures of success are you using for the student experience of blended learning?
- is there a good case study we should know about?

Key success factors

What are the key success factors in your institution?

- what have been the major obstacles you have had to overcome?

Other leads

Are there other institutions, examples or documents we should be looking at?

Do you wish your remarks to be attributed to

a) your institution

b) you personally

in public reports of this research? If yes to either or both, ask participant to write this on the consent form and sign it.

Thank participant for their time.

Explain that outcomes will be published on the HEA web site and when that would be expected to be.

Ask if we can contact them for follow up telephone interview if necessary.