The impact of Blackboard software on education globally over the past 10 years

Dr. Demetra Katsifli

January 2010
The impact of Blackboard software on education globally over the past 10 years, with a focus on the measurable benefits from using Blackboard Learn™ software and related technologies

Findings from an analysis of published educational research, formal reports and current debates among educators

January 2010

Dr. Demetra Katsifli
Senior Director Academic Innovation, Blackboard Inc.

Copyright © 2010 Blackboard Inc. All rights reserved.
### Table of contents

- **Executive Summary** 7

1 **Research Methodology** 13
  - 1.1 Aim of the study 13
  - 1.2 Organisation of the report 13
  - 1.3 Methodology 13
  - 1.4 Geographical spread of articles used in the study 17
  - 1.5 Quality of the articles 18

2 **Impact of using the Blackboard/WebCT platform from the perspective of:** 19
  - 2.1 The student 19
  - 2.2 The lecturer 28
  - 2.3 The researcher 34
  - 2.4 Further Reading 35

3 **Impact of the Implementation of the Blackboard/WebCT platform on Educational Institutions, their Learning and Teaching Strategies, Policies and Procedures** 37
  - 3.1 Introduction 37
  - 3.2 Institutional Learning and Teaching Policies and Procedures 38
  - 3.3 Productivity and costs 41
  - 3.4 Learning and teaching strategies 46
  - 3.5 Further Reading 48

4 **Current VLE debates and potential future directions** 49
  - 4.1 Development of educational practice, changing pedagogical models and consequences for the VLE. Distance Learning, skills-based learning, competency- based learning, lifelong learning 49
  - 4.2 Mobile Learning and the demands on the VLE 55
  - 4.3 Further Reading 56

5 **Case studies** 57
  - 5.1 Institutional Strategy 57
  - 5.2 Lecturers’ perspective 59
  - 5.3 Students’ perspective 61

6 **References** 63

7 **Glossary** 71
Executive Summary

This report provides an overview of educational research conducted globally since 2000 in higher education concerning the academic use of Virtual Learning Environments (VLEs), in particular the Blackboard platform, and related technologies. This research has focused on identifying the measurable benefits of using VLEs from the perspective of students, lecturers, researchers and the institution as a whole. The implementation of VLEs and associated experiences of the key stakeholder groups are examined in the context of national policies and priorities, as well as institutional policies and strategies. This report also presents the findings on the current debates and thinking on the future direction of e-learning.

Many studies have demonstrated the positive standing VLEs have with students, although this appears to be focussed in particular areas of VLE use. One study indicates that 50% of student activity within the VLE is focussed on administrative functions including reading announcements and submitting coursework. Other studies have supported this, showing for instance, the value placed by students on the ability to submit coursework online. In terms of pedagogic use, access to content resources tends to feature most strongly, followed by quizzes and discussion boards. Successful use and take-up of discussion boards and other interactive tools seems to be mixed. One study noted the value students placed on discussion boards while expecting academic staff to play a leading role in moderating discussion. There were also examples of students valuing synchronous and asynchronous discussion in aiding reflection and for peer learning.

There are indications that students are simply being strategic in selecting technologies and tools to meet their immediate needs with perceived usefulness and satisfaction being important factors. It is also worth noting that while students are generally within their comfort zones with regard to technologies, the issue of anxiety in the use of computers is a factor and can have a negative impact on learning. Other drivers have been noted as well, such as social pressure influencing engagement with educational technologies.

Interestingly, students appear more likely to engage in collaborative and interactive activities when they have implemented their ‘own’ environments (e.g., a Facebook Group or a shared Google document). However, it is also indicated that students do not fully understand the use of technologies in learning and teaching, and although they might be quite happy to collaborate and interact online in social environments, they are less likely to do this in educational environments. One study demonstrated the lack of understanding students have in the use of wikis in support collaborative learning.

Students do seem to value strongly face-to-face contact but one study indicated that although students were very positive about the provision of online resources, there were large differences between students on the value they placed on the ‘blend’ between face-to-face and online teaching and learning. For example, in the case of discussion boards, some students appreciated the ability to give considered responses, whereas others were concerned about the additional time required to
contribute. In addition, some students were positive about the use of discussion boards in promoting collaboration and interaction with peers, while others were more interested in the provision of materials and solutions given by academic staff.

Lecturers also have a significant impact on student use and engagement with a VLE, with the indication that many lecturers are replicating existing methods rather than developing new approaches, including interactive learning activities and the use of multimedia. One study demonstrated the value that academic staff placed on the VLE to enhance communication and to save time. Other studies, however, have shown that lecturers found that their use of Blackboard software has helped them to better meet the educational needs of their students and to achieve learning improvements in, for example, student assignment grades and independent thinking capabilities. In addition, it has been shown that some lecturers believe that their use of Blackboard software has enabled them to “enhance or elevate their assessment of student work and instructional capabilities in the face-to-face classroom setting”, Woods et al (2004).

In a number of studies, lecturers appeared to be less positive than students with regard to VLEs, with those lecturers who had no online experience viewing online learning as inferior to equivalent face-to-face learning and teaching. But among lecturers who had experienced online learning, the majority believed that learning outcomes were at least as good as those achieved in face-to-face environments. One recent study showed that few lecturers chose teaching or learning improvements as the most valuable benefit from using the Blackboard platform in their courses, backed up by other studies that indicated that VLEs had little impact on lecturers’ teaching methods. This was further supported in the literature on learning and teaching policies and strategies, and perhaps raises issues around academic staff training and development and their engagement with new pedagogic approaches. One study noted the use of the VLE as a document repository that can be used positively in engaging academic staff with e-learning but also warned that this approach can slow innovation. Lecturers’ positive attitudes towards e-learning, however, have been shown to positively influence students’ perceived satisfaction with online learning.

A number of research studies have illustrated a range of significant benefits to both students and lecturers from using a Blackboard solution, in a variety of ways that are summarised here to provide an overview of the possibilities when technology is used appropriately:

Koeber (2005) reports on the comparative study between sociology students taught with traditional face-to-face methods and students who used Blackboard software. Students’ evaluations were considerably more favourable in the group using Blackboard software; all measured dimensions of perceived teaching effectiveness yielded statistically significant increases, with substantial increases in perceptions of instructor rapport and grading.

Campbell et al (2008) found that “rather than being disadvantaged, participants in online discussions obtained higher marks generally in their assignments than those taking face-to-face seminars, suggesting that the online route was associated with higher achievement.”

The above finding supports that of Patzold (2005) who found that the more engaged students are with online materials via WebCT software, the better their test scores and that there is a strong correlation between forum (discussion boards) activity and final grades.
Hepworth et al (2009) report on how student activities whilst learning information skills in face-to-face sessions were compared with student activities on the Online Collaborative Learning environment in the Blackboard system, whereby the Online Collaborative Environment was shown to promote significantly greater critical thinking among students.

The findings in Farquarson (2007, p. 55) suggest “that participating in online activities might have an impact on students’ social experience at universities”. This could be used as a strategy to improve retentions rates, because supportive peer networks are an aspect of student engagement.

APLU (2009) found that amongst faculty members who had online teaching or development experience, a majority believe that the learning outcomes are as good as or better than face-to-face instruction. A total of 56% of all academic staff (those with online experience and those with none) have recommended an online course to at least one student, and over 80% of faculty members with online teaching or development experience have recommended an online course.

Morgan (2003) found that at the University of Wisconsin, academic staff reported that once they had used the VLE they did begin to re-structure their courses and eventually their pedagogic approach. They also argue that there are a number of other similar studies but there has been a lack of longitudinal studies which might identify how students and academic staff change their beliefs and approaches to the effective uses of technology in learning and teaching.

In terms of institutional strategy, a number of studies reported the importance of balancing top-down strategies and bottom-up approaches. Bottom-up approaches were important for engendering ownership and local relevance. As one paper noted, e-learning is rated highly as a change agent by managers but the key challenge is to broaden it out beyond the innovator. Strategies often underestimate the changes required.

It is also argued that new institutional structures and ways of working are needed to support large-scale implementation of e-learning, such as the implementation of quality frameworks that address e-learning. One paper noted the importance of balancing control through policy and regulation for the purpose of embedding new approaches against that of freedom of academic staff to innovate. Other key institutional issues related to academic staff reward and recognition, highlighting a perceived balance in favour of promoting academic staff based on their research success, possibly at the expense of pedagogic innovation (because professorships are normally awarded for research rather than for learning and teaching).

Academic staff development / training is a key factor in effecting change and it was noted that as academic staff became more proficient they tended naturally to become more self-reliant and therefore less inclined to explore new ideas and experiences by attending, for example, staff development events, workshops and learning and teaching presentations.

Assessing the costs and benefits of educational technologies and their implementation has taxed the sector over the last decade and a half with it reported that there is ongoing uncertainty about the relationship between costs, access and quality in online learning and noted inconsistency in costing new technologies. Very few studies have raised the possibility of
reducing costs, and others note that the economies of scale in higher education are complex. Total Cost of Ownership (TCO) is raised as one model for assessing all of the direct and indirect costs associated with technology implementation.

Twigg (2002) argues that in order to take advantage of using technology to reduce cost, there needs to be a fundamental shift in thinking, in terms of challenging the current instructional model. Instead of working harder, academic staff need to work smarter with a focus on effective and efficient learning, instead of on effective and efficient teaching.

From an economical perspective, Morris (2008) reviews the possibilities and limitations of economies of scale and scope for the use of e-learning in higher education. He argues that economies of scale, the spreading of fixed costs—like labour, infrastructure and course development—should be able to decrease with the increase of scale. In addition, centralization of common resources, like research and development, and marketing and recruitment, may also decrease with increased scope.

Some tangible costs and benefits have been detailed in the literature, including one institution identifying a cost of £6 per user per year for an institutional VLE with an additional £12 per user per year to cover the costs of all support staff.

In terms of future trends and developments, one study noted the difficulty that institutional strategies have in keeping up to date, in terms of changes and student empowerment enabled through Web 2.0 developments. Discussion on the role of Personal Learning Environments, including mobile technologies, has been particularly prevalent in the literature. The debate on the future of VLEs has been ongoing, especially in the blogosphere, with arguments both in favour of and against VLEs. Arguments postulated in favour of VLEs have included the provision of a safe, reliable and stable environment, easy to use for staff and students and providing order rather than the chaos of integrating multiple tools. Others have pointed out that VLEs and Web 2.0 technologies are not mutually exclusive but can coexist and be integrated. Sharratt (2009) points out that students do not ask for a high level of novelty, but that they prefer a predictable learning environment; students and lecturers are limited users of the Web 2.0 and the students are not pushing for new technologies.

Hughes (2009, p. 15-16) reports about VLEs that “They are closed rather than open systems. This is not to say that VLEs lack the capacity to be developed and implemented as more open systems; rather that they tend not to be deployed by HEIs in that way at present.”

The 2009 Horizon Report (Johnson et al. 2009) highlighted the growing importance in the short to medium term of four key trends: mobiles, cloud computing, geo-coded data and the personal web. There is some evidence that developments in these four areas are already taking place. For example, some educational institutions have already begun to outsource student email to Google. Podcasting and lightweight micro-blogging/social networking services like Twitter have added to the viability of mobile learning.

Such technologies offer higher education institutions the opportunity to remain “still bounded but with more penetrable walls so as to be increasingly able to absorb the benefits and learning occurring on the network as a whole as well as contribute to them.” (Leslie & Landon 2008: 21). Although the VLE may currently represent the “dominant design” (Wilson et al. 2007) in terms of educational technology infrastructure internationally, strong alternatives based more on peer-to-peer interaction and less asymmetric in terms of user capability (i.e., no hierarchy of instructors, graders and students) are emerging that pose challenges and opportunities for the future design of VLEs.
The debate about the future of the VLE could be seen as a debate that started as a reaction to the development of the personal web and its possibilities for the personalisation of a learner’s technological toolset. The personal learning environment creates new learning opportunities in which collaboration, feedback and informal learning plays a more central role than it has done historically. It supports forms of teaching and learning which are less teacher-centred and more student-centred. From this context the debate is related to a wider debate on the changing pedagogic practices of higher education globally.

To conclude, there is clear evidence of the efficiencies afforded to students and lecturers through the use of VLEs. Much of the efficiency is derived from what some would describe as administrative learning and teaching tasks, as for example, managing and accessing content, communications / announcements, the grade book, assessments/assignments and providing feedback, but the importance of this type of efficiency cannot be underestimated. Even if each individual is only saving as little as one hour per week per module or course, then the total amount of efficiency will be massive across the whole institution and in the busy life of the individual student. On top of this, there are the additional benefits of flexibility and convenience of access, flexibility of communication and collaboration including beyond the class groupings, all of which mean that a greater level of control is passed to the student.

There is further research evidence of how the use of VLEs has made significant improvements to learning outcomes, engagement with learning as well as enjoyment of learning. The more recent research findings illustrate the pedagogic benefits and also highlight that it is only through longitudinal studies that we will learn more about the changes in perceptions and pedagogic-led uses of VLEs.

Today, VLEs like Blackboard Learn™ have reformed themselves with Web 2.0 interfaces and the inclusion of collaborative tools like journals/blogs and wikis, with the additional ability to link seamlessly to external tools (e.g. Facebook) and to be accessed via mobile devices. We have seen rapid innovation in the technology; the important question remains as to how best to use the technology to improve the learning outcomes, the learning experience as well as achieve the maximum level of efficiency for the individual learner, the teacher and the educational institution as a whole.

New innovation in the use of technology in education over the next 5 years is something that we can predict will happen but today we are perhaps not able to predict accurately how it will happen. We need to build on past experiences, continue to apply the technology, experiment and learn from the collective experiences of students and educators.
1.0 Research Methodology

1.1 Aim of Study

The aim of this report is to provide an overview of educational research conducted globally since 2000 to 2009 about the use of Blackboard/WebCT software. In addition, the report covers current practices and an overview of potential future developments.

1.2 Organization of the Report

The report is divided into sections, as outlined below.

- Impact of the implementation of Blackboard/WebCT software from the perspective of the:
  - Student
  - Lecturer
  - Researcher

- Impact of the implementation of Blackboard/WebCT software on educational institutions, their teaching and learning strategies and their policies and procedures:
  - Institutional learning and teaching policies and procedures
  - Productivity and costs
  - Learning and teaching strategies

- Current debates and potential future directions:
  - Developments of educational practices
    - Developments in social media and the impact of Web 2.0
    - Web 2.0 and changed learner paradigms
  - Virtual Learning Environments (VLE) and Personal Learning Environments (PLE)
    - Open Course Ware and the VLE
  - Mobile learning and the demand on the VLE

1.3 Methodology

In this section, the methodology employed to search, manage, rate and process the articles is described. In order to find articles published after 2000, seven kinds of initial article searches were conducted in July 2009.
1.3.1 Library Search

A library search was conducted using an advanced search in the social science and education sections. The keywords entered for the search:

- “Blackboard”
- “WebCT”

This search resulted in 233 articles. The abstracts of those 233 articles were read and 65 articles were selected for further evaluation.

1.3.2 Online Journal Articles Search

A methodical search was conducted, browsing peer-reviewed articles published in the following online journals:

- ALT-J
- Computers and Education
- British Journal of Educational Technology

1.3.3 Open Access Online Journal Articles Search

A methodical search was conducted by browsing open access online journals (mainly peer reviewed), related to e-learning using keywords such as:

- Virtual learning environments (VLE)
- Course Management Systems (CMS)
- Learning Management Systems (LMS)
- Blackboard/WebCT
- Blended learning

The following journals were browsed:

- MedienPädagogik (German)
- e-learning and education (eleed) (Germany)
- The Electronic Journal of e-Learning (United Kingdom)
- The European Journal of Open, Distance and E-Learning (EURODL) (Europe)
- The Journal of Distance Education (Canada)
- Australian Journal of Educational Technology
- Australian The International Journal of Emerging Technologies and Society (iJETS)
- MERLOT (USA)
- Innovate (USA)
- First Monday (USA)
- EDUCAUSE (USA)
1.3.4 Web Search

The following keywords were entered into a web search engine

- Distance learning
- Blackboard/WebCT
- VLE
- E-learning
- Mlearning (mobile learning)
- Web 2.0
- Read-write web
- Social media
- Social software
- Personal web
- Personal learning environment
- Open educational resources
- OpenCourseWare
- Open source

1.3.5 Additional Literature

In addition, articles known by the authors of this report have been included, e.g., specific JISC and OHBE reports, journal special issues and papers by specific academics.

1.3.6 Cross-referenced Articles

During the literature search and reading process additional important articles were identified. These have also been included in the report.

1.3.7 Conference Notes

The current debate in section three was partly based on notes taken while attending the session “The VLE is Dead” at the Association for Learning Technology’s 2009 annual conference, “In Dreams Begins Responsibility.” Notes were completed with related online blog posts and journal articles.

An Excel spreadsheet was created that included all articles. The spreadsheet was shared by all authors on the Blackboard content system and contained the following columns:

<table>
<thead>
<tr>
<th>Article ID number</th>
<th>Reference type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Author(s)</td>
</tr>
<tr>
<td>Name of journal</td>
<td>Publication year / date</td>
</tr>
<tr>
<td>Journal volume</td>
<td>Journal issue</td>
</tr>
<tr>
<td>Article start and end page number</td>
<td>Abstract</td>
</tr>
<tr>
<td>Keywords</td>
<td>Geographical location of study</td>
</tr>
</tbody>
</table>
Once all articles were included in the Excel spreadsheet, they were rated on a scale from 0 to 4, according to level of importance with 0 = not important and 4 = very important. The level of importance was judged based on certain criteria including relevance to the different themes of the report, geographical location of the study, currency and magnitude of the study. A mean value was then calculated based on the 4 ratings. All articles with a mean value of 3 or higher were then included in the second stage of the process.

1.4 Geographical Spread of Articles included in Study

The majority of the papers included in this report are from the USA (37) and UK (29). Four papers report on research conducted in multiple countries. Six studies were conducted in Australia, one in New Zealand, four studies were undertaken in Canada, fifteen in Europe and eight in Asia. In addition, four studies were undertaken in Africa, one in South America and one in the West Indies. Subsequent to this stage of parsing the literature, some additional research was identified and included.

<table>
<thead>
<tr>
<th>Region</th>
<th>Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia, Australia, UK, USA</td>
<td>1</td>
</tr>
<tr>
<td>Australia</td>
<td>6</td>
</tr>
<tr>
<td>Australia, Canada, New Zealand, USA</td>
<td>1</td>
</tr>
<tr>
<td>Australia, the Netherlands, South Africa, UK, USA</td>
<td>1</td>
</tr>
<tr>
<td>Botswana</td>
<td>2</td>
</tr>
<tr>
<td>Canada</td>
<td>4</td>
</tr>
<tr>
<td>China</td>
<td>3</td>
</tr>
<tr>
<td>Colombia</td>
<td>1</td>
</tr>
<tr>
<td>Denmark</td>
<td>1</td>
</tr>
<tr>
<td>EC</td>
<td>1</td>
</tr>
<tr>
<td>Finland</td>
<td>1</td>
</tr>
<tr>
<td>Germany</td>
<td>5</td>
</tr>
<tr>
<td>Greece, UK</td>
<td>1</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>1</td>
</tr>
<tr>
<td>Iran</td>
<td>1</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
</tr>
<tr>
<td>Macedonia</td>
<td>1</td>
</tr>
<tr>
<td>New Zealand</td>
<td>1</td>
</tr>
<tr>
<td>Portugal</td>
<td>1</td>
</tr>
<tr>
<td>South Africa</td>
<td>1</td>
</tr>
</tbody>
</table>
1.5 Quality of the Articles

The majority of the research conducted on VLEs and related technologies are of small scale, and based on single case studies. Often, the researcher is the lecturer, and thus an active participant in the research project. In addition, much of the research design is not randomized experimental, and the confound variables are not controlled for. Thus, findings may not be generalized. In addition, most of the studies do not cover more than one semester and longitudinal studies are very few.

Methods used to collect data are limited to student and/or lecturer questionnaires and/or a data mining, where statistical data collected by the VLE system, such as hits, are analysed to measure VLE use by students and lecturers alike. However, lessons learned from the research studies are still valuable, but findings overall need to be interpreted with caution. Multiple research studies need to be conducted to answer the educational research questions. Research in the social sciences and in education in particular, is complex.

Acknowledgements

Blackboard commissioned Kingston University to work on this research. We are very grateful for the commitment and enthusiasm of the Kingston Academic Development team whose combined expertise in the field of educational research, evaluation and educational technology has been invaluable to Blackboard in bringing together and synthesizing a broad range of research data that forms the basis for this report. Special thanks to:

- Dr. Tim Linsey, Head of e-Learning;
- Dr. Ann Ooms, Senior Lecturer;
- Hendrik van der Sluis, Academic e-Assessment Developer;
- Tony McNeill, Principal Lecturer.
2.0 Impact of Using the Blackboard/WebCT Platform from the Perspective of the Student, the Lecturer and the Researcher

The section addresses research findings on the tangible, measurable benefits of using Blackboard software for students, lecturers and researchers.

2.1 The Student

2.1.1 Student Use

Griffiths & Graham (2009) undertook a study of patterns of user activity in the different features of the Blackboard CMS across all courses for one academic year (2004-5) at one university in the USA. They undertook an analysis of the click activity (data mining) and found that the most used features of the Blackboard platform were the course content folder, announcements grades and quizzes. The largest number of individual clicks was in using the announcement feature, accounting for about 35% of all student activity, rising to 50% when including other administrative functions. The remaining 50% of activity was linked with pedagogic activity, with accessing content resources receiving the greatest number of hits, followed by quizzes and discussion boards.

Lonn & Teasley (2009) undertook a two-year survey of students in a large Midwestern University in the USA. They found that almost every student on campus used the VLE and, similar to Griffiths & Graham, Lonn & Teasley found that 95% of student activities within the VLE were related to document management and communications. Unlike Griffiths and Graham however, they found that only 5% of user actions were in the more interactive components of the VLE (chat, discussion or wikis). This underuse of discussion boards was also reported by Green et al (2006).

Santhiveeran (2006), in evaluating a VLE course website by graduate social work students, found that it was accessed 23 hours a day, 7 days a week (day and night, evening hours and weekends) with the most popular area being the course documents area. Undergraduate accounting students in New Zealand have openly embraced the VLE but students are not eager to participate in two-way online activities (Wells, de Lange, & Fieger, 2008).

What is clear is that students are choosing to use the technologies, or features of VLEs, that meet their needs, and at times that suit them. Indeed, HEFCE/JISC, in a UK-wide report on students’ perceptions of e-learning, found that “learners
are now selecting their own blend of technologies to make their learning experiences more congenial, manageable and appropriate to their needs” (HEFCE/JISC, 2007, p. 32). Students appear to be engaging in a process of integrating personal tools for learning and technologies.

2.1.2 Student Perception, View, Value

There is a good volume of literature related to students’ perceptions of the use of VLEs. Much of the literature focuses on studies of students’ perceptions of using VLEs in general and, more specifically, which aspects of the VLE were most or least helpful.

A number of studies highlight the fact that today’s further and higher education students have grown up in the digital age and assume that technology such as the Blackboard/WebCT system will be a normal part of college/university life (MORI 2008). These students are excited by the technological options available (MORI 2008) which they perceive will assist and complement their studies. Such students do not imagine that the technology will complicate or inhibit learning or that the use of technology in education will take them out of their comfort zone (MORI 2008).

However, a small amount of the literature related to student perceptions focussed on personal characteristics of the student and how these affect the ease that students have when using VLEs. Van Raaij & Schepers (2008) for example, found that both personal innovativeness and computer anxiety have direct effects on perceived ease of use. Implications are that program managers in education should not only concern themselves with basic system design but also explicitly address individual differences between VLE users. A study by Sun et al (2008) supports this; finding that learning anxiety about computers will negatively influence perceived e-learner satisfaction. Lecturers’ attitudes towards e-learning, however, will positively influence students’ perceived satisfaction with online learning. An e-learning course that is flexible and is of high quality, according to Sun et al, will positively influence perceived student satisfaction, as well as students’ perceptions of the use of e-learning and the ease of using it.

Sivo et al (2007) found a causal relationship between subjective norms and student attitudes to WebCT software. In a survey of first year psychology students in a university in the USA they found that students’ attitudes toward WebCT software and the social pressure to use technology influenced how often students interacted with technology. The findings of Sivo et al also suggest that students’ attitudes towards technology can have a real, but small effect on final grades, demonstrating the importance of improving students’ attitudes towards technology in learning. MORI (2008) reiterated this impact of social pressure. In their findings, when students see others benefiting from new technologies they are envious and want to be included. Equally, when students establish their own mechanisms for collaborative learning, they are more engaged than when tutors establish these mechanisms (MORI 2008).

Liaw (2008) suggests that although the benefits of e-learning have been discussed elsewhere in the literature, it is important to have a better understanding of the reasons why some learners are dissatisfied with the e-learning experience. He examined learners’ satisfaction, behavioural intentions, and the effectiveness of the Blackboard system and found that perceived self-efficacy is a critical factor that influences learners’ satisfaction with the Blackboard system. Perceived usefulness and perceived satisfaction both contribute to the learners’ behavioural intention to use the e-learning system. Furthermore,
he concluded that the effectiveness of e-learning can be influenced by a number of things including multimedia instruction, interactive learning activities and e-learning system quality.

In the study by Lonn & Teasley (2009), students value those tools and activities within the VLE that promote efficient communication rather than the interactive tools for innovating existing practices. However, students also perceived that the teaching and learning tools within the learning management system were of high value. Students in this study believed that IT improved learning but they were less positive about the effect of IT on teaching. The most popular perceived benefit of IT to students was efficiency. Only a very small number of students in this study identified learning and teaching improvements as the most valuable benefit from using IT in their courses (Lonn & Teasley 2009).

Finally, the literature also suggests, in terms of students’ perceptions of the value of VLEs, that using ICT in teaching is only perceived as being a good thing if it is done well. The findings from MORI (2008) suggest that students perceive that inefficient or inept use of technology is worse than not using technology at all to support teaching and learning.

**Student Evaluation of Specific Components of the VLE**

In a literature review of over 300 studies of blended learning, Sharpe et al (2006) found that the student response to the use of VLEs is overwhelmingly positive with regard to the provision of online course material to supplement traditional teaching. Their literature review identified that there were large differences between students in terms of how they value the ‘blend’ between online and face-to-face teaching and that students need to develop a greater understanding of the role of technology in their learning (Sharpe et al 2006).

MORI (2008) found that more than two-thirds of students surveyed and interviewed accessed course material via the VLE and found it useful to do so. Students in this large study also valued the use of discussion boards and expected their lecturers to play a leading role in moderating discussions. However, students are less well exposed to, and have less understanding of, other tools for collaborative learning, such as wikis (MORI 2008). They are also less comfortable with using social networking sites with tutors as these sites require a horizontal relationship between users, which is not perceived by students to be the case with their tutors.

This finding is supported by JISC (2007) who found that students separate their technologies into two groups: personal tools, such as mobile phones, portable media players, social networking sites; and study-focused tools such as VLEs (JISC 2007, p. 19) and that students wish to maintain this separation of personal/social domains from formal study domains, and may use technology to maintain this separation. Whereas students engage in a high level of social interaction through their personal communication tools, they are more reluctant to engage in VLE-based discussion boards (JISC 2007).

The use of chat and bulletin board tools in Blackboard software to stimulate reflective learning in nursing students was examined in a small study (n = 25) by Morgan et al (2006). Students in this study reported that they developed more extensive reflective skills using Blackboard software than they did in the classroom. They also reported spending more time reflecting using the Blackboard platform and perceived that it contributed to more self-monitoring. However, this small study also found that there were varying levels of engagement and not all students were demonstrating a deep level of critical, analytical reflection. Ikiugo & Rosso (2003) used a combination of classroom discussion and Blackboard discussion boards to facilitate the development of professional identity in occupational therapy students. Their findings showed that
93% of the students perceived the combination of face-to-face and Blackboard discussions to be the strongest part of the course.

Several studies in the literature suggest that availability of course content material in Blackboard/WebCT software is perceived as a positive aspect of the VLE. Green et al (2006) found that students valued having course materials readily available online, especially having lecture notes available on the Blackboard system prior to lectures. Overall, this study (n = 625) found that 79% of students rated highly the use of Blackboard software in their learning.

Thomas & Storr (2005) encouraged first year occupational therapy students to use discussion boards for peer support and interaction. They reported high participation rates, however students were spending more time reading the discussions rather than contributing to them. Nevertheless, the authors concluded that online tools can support peer-supported learning.

The Blackboard tool that allows for assessment submission and assessment feedback has been studied by Bridge & Appleyard (2008). This was a small study (n = 47) undertaken to evaluate students’ perceptions of submitting assignments and receiving feedback via the Blackboard platform. They found that 88% of the students reported that submitting online was time-saving and 93% preferred online feedback rather than paper-based feedback handed to them. Students also reported a financial benefit with online submission (e.g. saving on the cost of printing an assignment).

Van Gundy et al (2006) investigated the effects of using a VLE with undergraduate students (n = 175) studying statistics and found an overall reduction in maths anxiety levels among the students. Discussion boards were also used in this study and seem to have a positive impact on students’ self-esteem. However, there was no impact on students’ perceptions of their mastery of the course content.

Lin (2009) undertook a study of teacher training students and their perceptions of the use of Blackboard software. Both quantitative and qualitative data were collected from surveys designed to measure students’ views of hybrid learning. Results showed that a majority of students held positive views, but some had negative experiences and faced challenges. In this study the favourite tool was the grade book, followed by practice tests and the communication / collaboration tools on the Blackboard platform. However, this was a small sample (n = 51) and the conclusions would need to be tested with larger studies.

Using Blackboard/WebCT software versus Face-to-Face Teaching

As with much of the literature on students’ perceptions’ of Blackboard software, Oladiran & Uziak (2009) found that engineering students in Botswana preferred any course delivery method that included traditional teaching. Whereas they would accept “chalk and talk” as the only method of teaching, they would not accept the Blackboard system as the sole method of course delivery. However, the majority of students in this study agreed that Blackboard technology generated interest in the course, enhanced learning and understanding of course content, provided useful feedback on assignments and improved interaction between students and lecturers. Additionally, an overwhelming majority of students in this study agreed that using the Blackboard system enhanced their IT skills, helped them to work more effectively alone or in groups, helped them meet deadlines and assisted them in keeping track of their grades. Finally, Oladiran & Uziak (2009) found that
over 75% of students perceived that the Blackboard system improved the quality of their studies. Again, this was a small study (n = 40) and the results need to be tested against larger studies.

The issue of the relationship between the use of VLEs and traditional face to face teaching has been explored elsewhere in the literature. Benoit et al. (2006) undertook meta-analysis of 20 studies (total n = 1877 participants) and found “that the effects of web-assisted instruction, compared with traditional instruction, indicates that web-based learning is not consistently more effective than traditional instruction methods.” “There is no significant advantage for either method of instruction.”

Benoit et al (2006) concluded that the data analysed support two conclusions. Firstly, web-assisted instruction is not generally superior to traditional instruction on the basis of amount of learning. Secondly, students consistently report greater satisfaction with traditional than web-assisted instruction. This second finding is supported by MORI (2008) who found that students still value face-to-face as the best form of teaching (MORI 2008, p. 10), however, students are motivated to use online learning because of the benefits it brings them in terms of flexibility, accessibility, saving time, not having to travel to campus, and fitting their learning in with other commitments.

McGill & Hobbs (2008) also conducted an analysis of case studies of VLE use since 2001 and concluded that VLEs are suitable for higher education but not necessarily better than “traditional lectures”.

Foster & Lin (2007) identified that investigations of the role of students’ study approaches in the online learning environments is a less explored area than studies of students’ study approaches in face to face learning environments. They undertook a survey to investigate the relationship between post graduate students’ approaches to studying and their perceptions and use of the WebCT system in an e-business and e-commerce course. Using a developed version of the Approaches to Studying Inventory (ASI), which is designed to investigate the interrelationship between deep, surface and strategic learning habits, they found that there is a strong correlation between the students’ attitudes to online learning and a strategic learning orientation. However, this was a small study (n = 35) and further studies would be needed to investigate the relationship between students’ attitudes to VLE and their approaches to study.

Other areas of the use of Blackboard/WebCT software that have been examined in the literature are the use of these VLEs in distance learning.

Shin & Chan (2004) studied the relationship between distance learning and use of WebCT software. Using student login data and survey methods, they measured the relationship between distance learning students who used additional online materials via the WebCT platform as a mandatory part of the course and similar students for whom the additional online materials were optional but were freely available if they chose to use them. When the online materials were optional, a direct relationship was found between the frequency of students’ visits to the course site and perceptions of their learning outcomes expressed as learning achievement, satisfaction and intent-to-persist. Basically this may indicate that a student who is accessing the online resources is achieving more benefit from the course than those who are not accessing these additional online resources.

When the online materials were compulsory however, student engagement with the online resources was not related to their perceptions of learning outcomes. This may be because the measure being used (frequency of access) is not sophisticated
enough and also partly influenced by possibly greater staff effort in getting student engagement on a fully online course. However it did appear that for students on fully online courses their engagement with online resources did seem to be significantly linked to their perceptions of institutional presence, i.e., how they felt linked with and engaged with the institution through the virtual medium.

2.1.3 Impact (quantitative and qualitative), learning outcomes, efficiencies & productivity

Mason & Rennie (2008) offer a range of perceived benefits of using VLEs and the tools within them. Although they discuss extensively these perceived benefits, they do not provide an evaluative evidence-base for the claims they make. They do, however, highlight areas where evaluative research could/should be undertaken into the impact of VLEs and their tools, including the use of discussion boards, chat, tests, digital drop boxes, blogs, wikis, podcasting and e-portfolios.

Impact on promotion of learning

Benoit et al (2006) in a meta-analysis of 20 studies (n = 1877) found that the effects of web-assisted instruction, compared with traditional instruction, indicates that web-based learning is not consistently more effective, in terms of promoting learning, than traditional instruction methods. They found that there was no significant advantage for either method in terms of impact on learning, but that students reported across a majority of the studies a preference for face-to-face teaching. Benoit et al (2006) suggest that “It is possible that as students continue to become more comfortable with new technology generally (e.g., iPods, cell phones) and the Internet specifically, both the amount of learning from and satisfaction with web-assisted instruction could increase. Similarly, as instructors’ understanding of, and ability to effectively implement, the potential inherent in web instruction increase, the amount of learning may increase.” (Benoit et al 2006, p.10).

Arbaugh (2004) undertook a study over a four-year period with students enrolled on an MBA programme (n = 1114). Findings show that while there was little or no significant change in students’ perceptions of learning between their first online course and subsequent online courses, there were significant positive changes in their learning satisfaction with the Internet as a course delivery medium, their perceptions of participant interaction, and the usefulness and ease of use of the course software. These findings suggest that as students gain transferable skills and knowledge in online learning, their perceptions of the VLE as a positive learning tool improve. Most of the significant changes in these perceptions occurred between the first and second times that the students participated in the study, which suggests that students need to study at least two online courses before drawing conclusions about this delivery medium. Degree programmes, therefore, should provide focused attention to first-time online learners in order to encourage their participation in subsequent online courses.

The findings by Attwell (2009), Lonn & Teasley (2009) and Bricheno, Higginson & Weedon (2004) indicate that in terms of impact on learning, VLEs have had some success in terms of improving communication, the areas of learning where use of VLEs have had less impact are collaborative and interactive learning. In a study of networked learning in 20 educational institutions, Bricheno (2004, p. 100) “collaborative and interactive activities do not appear to have changed significantly in many institutions.”
**Impact on achievement of learning outcomes/grades**

The relationship between the use of VLEs and student grades has been examined widely. Percival & Muirhead (2009) undertook a study of two groups of business and IT students at the University of Ontario, Institute of Technology. One group was taught by face-to-face methods (n = 136) and the other by blended learning (n = 68). Both groups were surveyed using a questionnaire and there was approximately 40% response rate to the questionnaire by both groups (n = 60; n = 38). The aim of the questionnaire was to ascertain student use of online material (via WebCT software) and assess the impact of this on overall grades. Only a small number students in both groups listened to the online recorded lectures. Those who listened to all recordings received higher grades. Blended learning students made slightly more use of e-books, podcasts and discussion forums but students across both groups did not like the spread of online materials (commercial sites, individual lecturer sites, plus material on the WebCT system). Percival and Muirhead (2009) concluded that although today's students are familiar with new technologies, it cannot be generalized that these students will automatically adopt, or are predisposed to, using these new technologies for learning simply because they are available. Students need to be familiar with the benefits of technology to their learning if they are to make the transition from tradition to online learning.

Similar findings were reported by Benson et al (2005) in a mixed-method study of students study on-campus (n = 112) and off-campus (online) (n = 81). No differences in motivation, satisfaction or achievement of learning outcomes were reported. Shin & Chan (2004) measured the relationship between students use of additional online materials in the WebCT system and expected learning outcomes. Those students for whom accessing online materials was optional expected to learn more by using these additional materials.

Koeber (2005) used a quasi-experiment and follow-up questionnaire to ascertain the effects of PowerPoint multimedia presentations and a Blackboard course website on the course grades and perceptions of teaching effectiveness of introductory sociology students. One group (n = 94) was taught with traditional face-to-face methods. A second group (n = 91) were taught through the redesigned presentation materials and the Blackboard system. Results showed no statistically significant difference in course grades between experimental and control groups. However, students’ evaluations were considerably more favourable in the experimental group using Blackboard software; all measured dimensions of perceived teaching effectiveness yielded statistically significant increases, with substantial increases in perceptions of instructor rapport and grading.

Students not only reacted positively to the instructor’s use of technology but through their own use of the technology increased their involvement in the course and perceived teacher effectiveness more favourably. Sauers & Walker (2004) undertook a study of students (n = 261) on a business writing class. The students were divided into traditional classes and web-enhanced classes using the Blackboard system. All students achieved higher grades during the course, but there was greater interaction between students using discussion board in the web-enhanced classes.

Campbell et al (2008) compared the influence of the discussion mode on student grades. The study compared a group of students engaging in face-to-face discussion with a group of students using the discussion board in WebCT software. The students choosing the online discussions had a higher assignment mark than the face-to-face students. Campbell et al (2006) found that “rather than being disadvantaged, participants in online discussions obtained higher marks generally
in their assignments than those taking face-to-face seminars, suggesting that the online route was associated with higher achievement.”

Davies & Graff (2005) undertook a study on student participation (n = 122) in online discussion using the Blackboard platform and their final grades. They found that the frequency of participation did not lead to higher grades. Nevertheless, those who participated infrequently did earn lower grades. According to Davies & Graff (2005, p. 663) “quality and dynamics of the interactions may be the more important influencing factors in learning and performance.” Similarly, Rodrigues et al (2006) undertook a study on biology students from the University of Puerto Rico who undertook an e-learning enriched module in Blackboard software using discussion boards. Two groups (n=51) were studied from a total of 395 students. The students who engaged more actively in the discussion boards had slightly higher scores in the final test. This finding supports that of Patzold (2005) who found that the more engaged students are with online materials via the WebCT system, the better their test scores and that there is a strong correlation between forum (discussion boards) activity and final grades. This finding is opposite to that of Green et al (2006) who found that the frequency of use of the VLE did not strongly correlate with final examination marks achieved.

Bunce et al. (2006) compared the influence of SRS (Student Response Systems) and quizzes in the WebCT system (n = 41 in a US university) on the final grades. Undertaking quizzes in the WebCT system provided opportunities for reflections and review, and had a positive impact on learning, while SRS did not offer opportunities for reflection on feedback, except during the lecture. Both methods had almost no impact on final grade score. On the other hand, Sivo et al (2007) found that students’ attitude towards VLEs can have a small, but real, effect on final grades, leading the authors to conclude that improving student attitudes to instruction with Blackboard/WebCT software is important. McFarlin (2008) compared the grades of two groups of students. One group was taught in traditional face-to-face methods; the other taught using a hybrid approach. The hybrid group had to prepare themselves in the first part of the course (50% of the time online) with annotated presentations, podcast, animations and quizzes available on the WebCT platform. Both groups were treated the same in the second part of course. The students in the hybrid group had 9.9% higher grades.

Impact on social experiences

Hramiak (2007) undertook a longitudinal case study to investigate the use of a virtual learning environment to enhance the placement experience for full time postgraduate certificate in education (PGCE) students. She observed that these students (n = 9) were geographically separated whilst on practice placements and can feel very isolated. The purpose of the VLE was to try to alleviate this by offering a way for trainees to maintain contact and offer mutual support whilst on placement, and to create a sense of community for placement students with the help of discussion board and synchronous chat. The outcome, however, was that students hardly used the discussion board and had technical difficulties using chat. When chat worked, however, even though the participation rate was low, it was perceived as very friendly and informal and the participants found it useful. In the group interview and in survey, students stated that they preferred email to stay in contact with their peers. The VLE was at best useful for information but not really used significantly as an interactive and collaborative tool. Hramiak concluded that there are some aspects of face to face teaching and learning that are difficult to replicate using e-learning technologies.

Farquharson (2007) investigated the impact of different modes of tutorial discussion on creating a social relationships among students (n = 144). Three different modes of discussion were compared: online discussion in Blackboard software (n
The Impact of Blackboard Software on Education Globally Over the Past 10 years

Impact on development of reading/critical thinking skills/team working

Burgess (2009) used the discussion board and chat in the WebCT platform to enhance critical thinking and engagement in developmental education at a community college in Texas, USA. The students (n = 18) found it useful and helpful, it helped them to develop their reading skills. This is a small study and larger studies would need to be undertaken on the relationship between discussion boards and chat tools on VLEs and the development of critical thinking and reading skills.

Carbonaro et al (2008) compared face-to-face and blended learning modes of delivery and the influence on the development of team process skill, team dynamics and achievement of course learning objectives of nursing students at University of Alberta, Canada. Blended learning was offered using virtual classroom technology from Elluminate and WebCT software. They found no difference in the achievement of team process skills between the two groups. Some differences were observed in the team dynamics due to absence of body language in online discussion. Some greater positive enjoyment was found in the blended learning group.

Hepworth et al (2009) report on how student activities whilst learning information skills in face-to-face sessions were compared with student activities on the Online Collaborative Learning environment in the Blackboard platform. The online collaborative environment in the Blackboard system was shown to promote significantly greater critical thinking among students. Critical thinking was evidenced through students’ ability to engage with and use information (evidence was gleaned from students assessed work, questionnaire responses and interview transcripts) and was demonstrated as students progressed through four distinct levels of information discernment.

2.1.4 Sustainability

There is relatively little evaluative literature related to the sustainability of the use of the Blackboard / WebCT systems. Two studies were analysed.

Sun et al (2008) explored why, with a growth rate of 35.6% in the e-learning market, many users stop their online learning after their initial experience. In exploring this absence of sustainability, Sun et al (2008) found sustainability of e-learning occurs through student satisfaction. They identified a range of factors that influences student satisfaction including learner computer anxiety, instructor attitude toward e-learning, e-learning course flexibility, e-learning course quality, perceived usefulness, perceived ease of use and diversity in assessments. Institutions need to improve learner satisfaction and e-learning implementation to ensure sustainability.

A similar relationship between student satisfaction and sustainability was found by Arbaugh (2004), who identified the changes in post-graduate students’ perceptions of technological, course conduct, and course outcome variables as they participated in multiple online courses over a four-year period. While there was little to no significant change in students’ perceptions of learning between their first online course and subsequent online courses, there were significant positive
changes in their satisfaction with the Internet as a course delivery medium, their perceptions of participant interaction, and the usefulness and ease of use of the course software.

One of the issues of sustainability of VLEs is training for academic staff. Griffiths & Graham (2009) suggest that:

“The analysis of feature usage, which shows that the top six features account for 90% of all activity, may suggest that there is a need to improve the faculty training for the less used features of the CMS.” (Griffiths & Graham 2009, p. 291)

2.2 The Lecturer

2.2.1 Lecturer Use

There is a small volume of literature available related to lecturer use of the Blackboard and WebCT platforms. What literature there is focuses on the numbers of lecturers using VLEs, but primarily for course administration, with some additional literature available about other aspects of lecturer use.

The Association of Public and Land-Grant Universities in the USA published a report on the use of online learning by faculty members (APLU 2009). In their survey of faculty members at US universities, nearly one-quarter of all faculty who responded (23.6 %) were teaching at least one online course at the time of the survey. Over one-third (34.4 %) of faculty indicated that they have taught online. Additionally, the most experienced faculty, those with more than 20 years of teaching experience, are teaching online at rates equivalent to those with less teaching experience. About one-tenth (9.3 %) of all faculty members reported that they were currently working on developing an online course. The percentage of faculty who have developed an online course (33.5 %) is virtually the same as the percentage of faculty who have taught an online course.

Woods et al (2004) found that faculty members primarily use the Blackboard system as a course management/ administration tool to make course documents available to students and manage course grades. Few faculty used Blackboard software for instructional or assessment purposes and even fewer used Blackboard software to foster a more positive sense of community. Woods et al (2004) also found that the main factor that determined usage (administrative and instructional) was experience with the tool; 65% of faculty members used Blackboard software out of personal or professional interest; 39% as a result of attending a training class; 29% because of strong encouragement by administration; 27% encouraged by colleagues; 11% encouraged by students. However, 60% never used the Blackboard platform as a means for developing a stronger sense of classroom community.

This primary use of the Blackboard system by faculty members as a course management/ administration tool is supported elsewhere in the literature, e.g., Griffiths & Graham (2009); West et al (2007); Bricheno et al (2004). Griffiths & Graham (2009) found that lecturers performed an average of 247 clicks per course with a standard deviation of 25. The highest level of activity was in the content folder, and the greatest number of clicks was in content, announcements, discussion board and grades. Almost 60% of clicks were on Grades and in total, 78% of all clicks were on grades, communication
and announcements. Their conclusion is that lecturers primarily used the Blackboard platform as an administrative tool. Similar findings were identified by Bricheno et al (2004).

Lonn & Teasley (2009) using data mining and a survey of users of the Sakai VLE found that most academics valued communication with students via the VLE, followed by efficiency (saves time). Overall, the document management and broadcast communication tools (file sharing, assignments and announcements) are heavily used by 95% of all users. Interaction tools, such as chat, discussion and wiki, only account for 5% of user actions. The survey demonstrates that instructors highly rated activities within the VLE that make the transmission of course materials and announcements more efficient. Student data within the same study concurred with this and this positive viewpoint increased for both groups over time.

West et al (2007) undertook a survey at a university in the USA and found that the most favoured features of the Blackboard system are email, announcements, course documents and the online grade book. The features of the Blackboard system with which they were most dissatisfied were the ones commonly referred to on campus as the pedagogical features, such as synchronous chatting tools, discussion boards, assessments and the “digital drop box.” Their findings suggest that the Blackboard platform was mostly used for teacher-centred, rather than student-centred instructional activities.

Teachers are also turning to VLEs to help them to address practical problems related to shortage of teachers, decreased time available and increased class sizes. Feustle (2001), for example, responded to the problem of shrinking numbers of qualified language teachers and the subsequent increase in time pressures and growing class sizes by exploring the possibilities of Blackboard and WebCT software to deal with this problem. This study concludes that both VLEs are useful for offering enriched learning experiences, especially the grade centre and for making learning materials available.

Feustle (2001) interestingly notes this, despite the fact that there is very a good range of bespoke language learning software available, both the Blackboard and WebCT platforms have the capacity to combine different instructional media into a single whole, in a way that makes it available to students all day and every day, concluding that the Blackboard and WebCT platforms have a rich long-term potential for language teachers.

2.2.2 Lecturer perception, view, value

Lecturer satisfaction with the Blackboard and WebCT platforms

West et al (2007) found that on the whole, faculty members were moderately satisfied with the Blackboard platform as a course management tool, but only if their institution provided a stable service. However, West et al (2007) also found that the features of Blackboard software were used primarily to increase the efficient transfer of information from teacher to student. Other studies show different perceptions of teaching staff to Blackboard software. APLU (2009) found paradoxical views of lecturers towards the Blackboard platform. With regard to lecturers’ perceptions of online course quality the APLU report found that over 80% of faculty with no online teaching or development experience believe that online learning outcomes are inferior or somewhat inferior to the outcomes for face-to-face instruction. However, amongst faculty members who had online teaching or development experience, a majority believe that the learning outcomes are as good as or better than face-to-face instruction. A total of 56% of all academic staff (those with online experience and those with
none) have recommended an online course to at least one student, and over 80% of faculty members with online teaching or development experience have recommended an online course. Many faculty members also expressed dissatisfaction with the amount of institutional support they received for online development and delivery activities.

**Faculty attitudes toward Blackboard Software**

Woods, et al (2004) found that faculty members’ attitudes were positive when it came to the classroom management functions of the Blackboard system but their attitudes were neutral in terms of its instructional and psychosocial benefits. Female lecturers had more positive attitudes than male lecturers in terms of the Blackboard system’s potential to enhance classroom management and foster a positive relational climate. Across all faculty members, 34% used Blackboard software to solicit a greater diversity of student opinions than is otherwise possible in the face-to-face environment and 60% agreed that certain features in the Blackboard system enhanced or elevated their assessment of student work and instructional capabilities in the face-to-face classroom setting.

A total of 82% agreed or strongly agreed that the Blackboard platform helped them to more clearly communicate information about course procedures and requirements, and 66% agreed that the Blackboard platform helps them to better meet the educational needs of students. Finally, 65% agreed that the Blackboard platform helped them to better manage their time with regard to administering the course and its requirements and 62% agreed that Blackboard enhanced their students’ ability to learn course materials.

Lonn & Teasley (2009) found that lecturers believe that the technology improved teaching and learning but were more positive about the effect of it on their teaching than on students. Lecturers perceived that the greatest benefit of the Blackboard software to them was how it improved their communication with their students. Very few lecturers chose teaching or learning improvements as the most valuable benefit from using Blackboard software in their courses.

Mitchell & Geva-May (2009) undertook a study to explore attitudes towards, and attitudes affecting, online learning implementation. In recent years there has been greater acceptance of online learning by institutional decision-makers, as evidenced by higher levels of institutional involvement, by greater faculty acceptance lags behind. This gap affects the widespread adoption of online learning. Mitchell & Geva-May (2009) propose that faculty acceptance of online learning is influenced by attitudes related to four variables that affect practice change. These are:

- Intellectual reluctance, e.g., concerns that students taught online may not achieve as well as those taught traditionally.
- Support, e.g., training, time and assistance
- Change, in particular with regard concerns in changes to the structure and operation of the institution. Although there was an indication that staff felt their jobs might become less interesting and harder they did not feel that their posts would be threatened.
- Cost-benefit, where the greatest concern was with the perceived additional funding needed to support online learning.
Inherently, these attitudes translate into behaviours that influence the level of resistance toward online learning. They found that lecturers are concerned about the extra workload and effort required to implement online learning, as well as the perceived increase in funding that is required.

### 2.2.3 Pedagogical impact (quantitative and qualitative), engagement, efficiencies, quality & grades

The pedagogical impact of the Blackboard/WebCT software is addressed in the literature in several ways.

#### Impact of e-learning on students and on campus culture

Sun et al (2008) found that the attitudes of instructors towards e-learning have a significant effect on learners’ attitudes to e-learning and their satisfaction with their e-learning experiences.

APLU (2008) undertook 231 interviews with administrators, lecturers and students across 45 public universities in the USA. They concluded that online learning programmes have the potential to change campus culture provided that senior people within the organisation are fully engaged in delivering the message that online learning is fundamental to the pedagogic mission of the institution. Online learning must be a key component of strategic planning.

#### Impact of using VLEs on teaching and the role of the teacher

Bricheno et al (2004) interviewed teachers in a number of higher and further education colleges in the UK. They found that using VLEs had little impact on lecturers’ teaching, on the development of innovative approaches to teaching and caused little change in the role of the teacher.

#### Impact of the Blackboard/WebCT platform on learning

Limniou, Papadopalous & Whitehead (2009) compared pre-laboratory activities undertaken online with the same activities undertaken face-to-face. Pre-laboratory activities have been known to improve students' preparation before their practical work as they assist students to make available more working memory capacity for actual learning during the laboratory. The aim of this investigation was to compare two different teaching approaches which supported a pre-laboratory session by using the same simulation program. The investigation was conducted in two countries (Greece and UK). The Greek students attended the course in a computer cluster, where the teacher and the students communicated face-to-face. The English students participated in the online course in the WebCT platform, where there was an online asynchronous discussion.

A crucial point which emerged from this investigation was that the simulation program in the two different pre-laboratory training sessions resulted in the same learning outcome; however, the learning characteristics and the teacher's effort were different. Thus, the teacher could adopt either teaching approach depending on the university facilities, the academic staff's time and the students' familiarity with virtual learning environments. In each case, students followed a different way (collaboration or/and independent learning) to obtain the similar learning outcome. In all cases after their pre-laboratory training session they entered the laboratory performing the experiments without any further instructions. Additionally, the teacher's role was slightly different in the two teaching approaches. In the computer cluster, the teacher had a more active role guiding students to obtain the expected learning outcome through face-to-face discussion and interaction. In the case
of the virtual learning environment (the WebCT platform), the teacher had more of a facilitator role, focused on posing questions to the students and collecting the resources to promote independent learning.

**Impact of the Blackboard/WebCT platform on institutional pedagogic resources**

Allen & Seaman (2008) have demonstrated that chief academic officers within universities in the USA believe that it takes more time and faculty effort to both develop and deliver courses online. The faculty survey conducted by APLU (2009) supports this perception; nearly 64% of those surveyed indicated that they perceive that it takes somewhat more or a lot more effort to teach online. With regard to online course development, 85% of faculty members surveyed perceived that online course development takes somewhat more or a lot more effort.

**2.2.4 Development of Teaching and Learning Practices Pedagogical Development, Teaching Models in Relationship with VLEs**

Coopman (2009) argued that Blackboard's e-learning system dominates the online learning software market. She critically examined the structure of the Blackboard (v8.0) and WebCT (CE6) platforms. In doing so she identified ways in which the platforms both constrain and facilitate instructor–student and student–student interaction. In addition, she identified features that sustain and challenge traditional power relationships in the classroom, concluding with implications for online pedagogy and practical applications for instructors and students.

The mixed or hybrid method has become an increasingly popular course delivery model in recent years, but research regarding the effect of mixed learning is limited because of its recent debut in the landscape of educational technology. Lin (2009) undertook a one-year exploratory study that looked at 78 teacher trainees’ view of learning in four mixed courses that used Blackboard software to supplement, as well as replace, some portions of face-to-face instruction. Both quantitative and qualitative data were collected from surveys designed to measure students’ satisfaction and perspectives of hybrid learning. Results suggested high level of satisfaction but also revealed several important issues and complexities involving hybrid course implementation. One of the findings from this study was that the integration of the Blackboard platform enabled diverse approaches to teaching and learning, sometimes in ways that could not be achieved by traditional methods.

Barnes & Tynan (2007) suggest that today’s undergraduates already live in a Web 2.0 world, have new service expectations and are increasingly dissatisfied with teacher-centred pedagogies. To attract and retain these students, universities will need to rethink their operations. New social technologies mean that universities have the chance to create a new generation of student-centred learning environments. Barnes & Tynan (2007) draw on pedagogical theories of constructivism and connectivism (Siemens 2005) to argue for new approaches to pedagogy where, with the help of technology, students play a part in shaping their learning environment.

Online technology can also create new opportunities for changing teaching practices with large groups of students. Smith (2006) explores how the principles of virtual class ‘chatiquette’ can help to moderate large classes during a discussion board session. He argues that class ‘chatiquette’ may help to bridge the gap between rigidly moderated virtual lectures and spontaneous and unstructured chats. However, this is a theoretical paper only and further research would be needed to test this premise.
Cousin (2005) argues that VLEs were originally designed within the broadcast phase of technology, in that, as with television and radio, they tend to be unidirectional with “a small number of producers, too many consumers” (Cousin, 2005, p. 122). As a consequence, VLEs provide an online space that allows tutors to replicate existing learning and teaching practices based on a lecturer transmitting knowledge to students. Cousin (2005) suggests that unless pedagogical experimentation is encouraged, VLE environments tend to be skewed towards the simulation of the classroom and other traditional locations. Cousin concludes that VLEs should be seen as “transitional objects, enabling academics to work with the new and the old simultaneously”. (Cousin 2005: 127-8).

A similar argument has been made by Weller (2008) in a blog posting on the challenge to established VLEs presented by Web 2.0 technologies he suggested that:

... the reason the centralised LMS (Learning Management System) is not the answer to the ‘Web 2.0 problem’ for education is because in its software DNA it embodies the wrong metaphor. It seeks to realise the principles of hierarchy, control and centralisation – the traditional classroom made virtual. This approach won’t help educators understand the new challenges and opportunities they are now facing. (Weller, 2008 at http://mfeldstein.com/sociallearn-bridging-the-gap-between-web-2-0-and-higher-education/)

Bayne (2008) identifies some of the ways in which commercial VLEs, such as the Blackboard and WebCT systems, brand themselves with a vision of higher education that is highly conventional and hierarchical, arguing that commercial VLEs:

“limit[s] the sense of the information space as a domain where new and potentially radically other pedagogical practices might emerge and be nurtured.” (Bayne 2008, p. 398)

Stiles (2007) also makes the case that VLEs have played a role, if not in stifling innovation and creativity, but in promoting pedagogic orthodoxy. The fact that VLEs are used extensively as repositories for notes and content may help to enable lecturers to get involved in e-learning, may also contribute to the slowness of pedagogic innovation in e-learning (Stiles 2007).

JISC (2007) provides evidence for VLE use tending towards the pedagogically conservative, reproducing the ‘transmission’ model of education rather than fostering greater student participation and learner autonomy:

“...VLEs are often used for passive rather than active learning and a significant number of respondents in the LXP survey listed discussion boards as one of their least used technologies. This may indicate a need for staff development in creative learning designs based around a VLE and greater understanding by both staff and learners of the role of asynchronous communication in learning.” (JISC 2007, p.26)

A position adopted in a number of publications (e.g., Franklin & Armstrong 2009; Dalsgaard 2006) suggests that tutors with an interest in pedagogic innovation and in encouraging more active and autonomous learners are better directed to Web 2.0 tools and environments. For example, Franklin & Armstrong (2009) claim that:
Dalsgaard (2006) writes of the use of self-governed, problem-based and collaborative learning activities and suggests that there is a mismatch between the underlying pedagogic approach of these activities and VLE functionality. He argues for a move beyond learning management systems with their emphasis on the management of student learning and, instead, a move towards a range of digital tools and environments that empower students in their self-governed, problem-based and collaborative activities.

The fundamental question here is whether there has to be a balance between the use of the VLE and other digital tools to help achieve the desired learning outcomes. VLEs such as the Blackboard system do provide tools for online collaboration and for students to choose who they collaborate with online; but these tools are not necessarily used or even thought about in some of the studies that recommend a move away from the VLE.

2.3 The Researcher

2.3.1 Researcher Use

There is a growing body of literature about how researchers are using Blackboard and WebCT software for research activity. Kenny (2005) for example, reports on a study that explored whether active engagement and group interaction could be captured in an online environment. She used an online focus group within the WebCT platform for her data collection. Her findings showed that the experience of conducting an online focus group was a positive one. Advantages such as cost savings and convenience for both researcher and participants were identified. This study demonstrated that participants could be actively engaged over a two-month period and that group interaction could be achieved to collect richly detailed research data. Whilst online focus groups may not be suitable in every situation, the potential exists to capitalize on technology to bring together a group of people separated by distance in an online environment that encourages interactive discussion.

2.3.2 Researcher perception, view, value

Research into the acceptance of e-learning and the technology that it supports has focused on the use of different models to support such research. The Technology Acceptance Model (TAM) is a favoured model for some researchers (Davis et al 1989; Adams et al 1992). The Technology Acceptance Model (TAM) is an information system theory that models how users come to accept and use a particular technology. It is based on the Theory of Reasoned Action (TRA) and is grounded in social psychology. The TRA asserts that both the attitudes towards a specific behaviour and subjective norm have an impact on behavioural intention which in turn determines our actual behaviour (van Raaij & Schepers 2008). The TAM model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably:

- Perceived usefulness: the degree to which a person believes that using a particular system would enhance his or her job performance or learning.
- Perceived ease-of-use: the degree to which a person believes that using a particular system would be free from effort.
The TAM model shows the factors that influence the acceptance of technology. The main factors are the perceived usefulness and the perceived ease-of-use. The model is most researched by Davis et al. 1989 and based on the Theory of Reasoned Action (TRA), which is grounded in social psychology. It asserts that TAM is a model that mentions the psychological factors that affect computer acceptance and assumes that perceived usefulness and perceived easy-of-use influence individual attitude using technology. TAM has a number of follow-up or extensive models like TAM2, UTAUT Unified Theory of Acceptance and Use of Technology (van Raaij & Schepers, 2008) and TUM Technology Use Model (Liaw 2008).

Another technique favoured by some researchers who study the use of the technology underpinning e-learning is data mining which has been mentioned previously in this literature review (e.g., Griffiths & Graham, 2009; Lonn & Teasley 2009). Data mining is a technique for analysing the use of a VLE by staff and students by using log files and statistics. Data mining enables the vast amount of data that is created by e-learning systems to be used for research purposes. It is an emerging discipline that has arisen out of the use of VLEs (Romero et al, 2008).

Kenny (2005) argued that undertaking focus group interviews via a VLE such as the Blackboard system brings cost savings. Face-to-face focus groups are costly in terms of location, tape production, transcribing of data, comfortable environment and often food/drinks are provided to participants. She argues that focus groups in the Blackboard system are convenient for both researcher and participants. The site was easy to set up whereas face-to-face focus groups are not easy to organize because all players need to be available at the same time and place. The focus groups in the Blackboard system are also longitudinal instead of one-off. According to Kenny (2005) more questions can be asked than in face-to-face focus group and it is possible to refine questions and introduce new questions as discussions emerge.

Kenny (2005) found that most of the participants described themselves as new users and with a short demonstration provided by the researcher, participants indicated they felt comfortable using the technology within a few minutes. It was important to participants that they had the option of anonymity but they suggested that participation became addictive, and they expressed enjoyment and satisfaction, viewing their participation as an achievement. No one dropped out of the discussion and the only limits to undertaking research in this way was participant’s access to a computer (Kenny (2005)).

2.4 Further Reading

On the Use of Blackboard Software


Students

JISC (2007) In Their Own Words: Exploring the learner’s perspective on e-learning. London, JISC/HEFCE

Lecturer


Pedagogy

JISC (2007) In Their Own Words: Exploring the learner’s perspective on e-learning. London, JISC/HEFCE
3.0 Impact of the Implementation of the Blackboard/WebCT platform on Educational Institutions, their Learning and Teaching Strategies, Policies and Procedures

3.1 Introduction

This section discusses the impact of the VLE on academic institutions and organisational change, and provides an outline of the pedagogic planning tools / frameworks being used by educators. Additionally, how technology has facilitated pedagogic change is discussed (i.e. how the Blackboard platform can transform the way in which institutions deliver learning and teaching).

MacKeogh & Fox (2009) highlight the importance of national polices and priorities with regard to economic and social development in driving institutional policy and practice, while highlighting the role that educational technologies can play. This is reinforced by Stiles and Yorke (2006) who argue that the institutional scale implementation of VLEs and other educational technologies is often in response to political and economic factors.

In the UK, national policy driven through government funding has been a significant driver, as demonstrated by the impact of the Teaching Quality Funding (TQEF) with a requirement on each institution to develop and implement a learning and teaching strategy (see HEFCE, 2005), followed by the HEFCE strategy for e-learning and latterly the revised approach to learning and technology. MacKeogh & Fox describe the establishment of a national e-learning strategy in New Zealand along with associated funding streams. They further identify the following key drivers for institutions in implementing e-learning:

- Enhancing reputation
- Developing information skills / information literacy
- Widening access
- Supporting the disabled student
- Improving quality of teaching and learning
- Increasing flexibility
- Reducing cost/improving cost effectiveness
In a survey (n=122) of Commonwealth Universities (Garrett & Jokivirta, 2004) 71% had some form of e-learning strategy in place and 73% with an institutional VLE in place, where the Asia-Pacific region was leading with a figure of 84%.

However Salmon (2005) argues that although e-learning and its role as a change agent is rated highly by many senior managers, significant developments beyond those of the innovators are limited.

### 3.2 Institutional Learning and Teaching Policies and Procedures

MacKeogh & Fox identified that the key driver for Dublin City University in implementing e-learning was to find solutions to some of the key challenges to which the institution faced including:

- Declining student funding
- Differential growth
- Widening participation
- Quality of learning and teaching

Bricheno et al (2004) argue that from their study of 20 institutions, new ways of working and structures are needed to support large-scale implementation of e-learning. The majority of institutions surveyed reported few changes to quality assurance and monitoring procedures as a result of the implementation of e-learning.

A number of institutions have developed quality frameworks for e-learning (Inglis, 2008). A framework is required as it is argued that a single measure of quality is not appropriate for an academic programme and therefore the framework will include measures of quality including Quality Assurance and benchmarking. For example, Inglis describes the Universitas 21 (an international network of 21 research-intensive universities established to promote collaboration and cooperation) framework as having five components covering the programme, content, instructor, pedagogy and learning platform, where each of these components is broken down into a number of quality attributes, e.g., track record, rigour and recognition.

Ireland, et al (2009) describes a framework at the University of Western Sydney that is designed to measure quality assurance and to promote quality improvement. The framework includes basic standards for e-learning sites, including attributes such as appearance, consistency and the appropriate use of tools; advanced standards, including for example "site design driven by learner-centred pedagogy" (Ireland, et al, 2009, p. 6); and a staff development toolkit linking the basic and advanced standards. Ehlers (2009,) considers the issues of quality in reference to learner-centred pedagogies and use of Web 2.0 technologies, and summarises that the processes and instruments required will challenge HEI’s at multiple levels.

In the UK, the Higher Education Academy (HEA) invited HE institutions in 2005 to participate in the e-learning benchmarking exercise (HEA, 2009). Those institutions who participated could implement one of five benchmarking methodologies:

- Observatory for Borderless Higher Education/Association of Commonwealth Universities (OBHE/ACU) benchmarking methodology
- Embedding Learning Technologies Institutionally (ELTI)
- e-learning Maturity Model (eMM) developed by Stephen Marshall at Victoria University of Wellington, New Zealand
• MIT90s - framework developed at MIT
• Pick & Mix - developed by Paul Bacsich

The Pick & Mix methodology (http://elearning.heacademy.ac.uk/wiki/index.php/Pick&Mix) involves scoring the institution against a number of criteria (See Table 2) including, for example, VLE stage, Tools and Usability with the VLE level descriptors, and the e-learning strategy descriptors provided below (see HEA, 2009b).

**Table 2: Example section of the Pick & Mix Methodology**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>Level 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLE Stage</td>
<td>No VLE.</td>
<td>Different VLEs across different departments.</td>
<td>VLEs reducing in number to around two.</td>
<td>One VLE chosen for future but not yet replaced former VLEs.</td>
<td>One VLE.</td>
<td>One VLE but with local variants when strong business case, and activity of a post-VLE nature.</td>
</tr>
<tr>
<td>e-Learning Strategy</td>
<td>No e-learning Strategy. No recent Learning and Teaching Strategy.</td>
<td>Some mention of e-learning within the Learning and Teaching Strategy.</td>
<td>e-learning Strategy produced from time to time, e.g., under pressure from Funding Council or for particular grants.</td>
<td>Frequently updated e-Learning Strategy, integrated with Learning and Teaching Strategy and perhaps some others.</td>
<td>Regularly updated e-learning Strategy, integrated with Learning and Teaching Strategy and all related strategies (e.g., Distance Learning, if relevant).</td>
<td>Coherent regularly updated Strategy allowing adaptations to local needs, made public, etc.</td>
</tr>
</tbody>
</table>

The full version of the Pick & Mix scheme can be downloaded from:
http://www.matic-media.co.uk/benchmarking/PnM-2p5-beta3.xls

Stiles & Yorke (2006) argue that the introduction of e-learning is a complex process involving institutional change and that strategies often underestimate the changes needed in an organisation and in professional practice. They describe the implementation of a centralised learning and teaching strategy at the University of Staffordshire in 1996 focussing on “learner-centeredness and resource-based learning”. They reported limited localised success with an initial strategy dependent on encouraging enthusiastic staff to apply for specific project funding that is aligned with the strategy.

The approach was evolved through a number of iterations including a review of institutional policies and procedures to address the issue of embedding and that of ‘vertical coherence’ with the institution’s procedures and processes. A key
issue that emerged was achieving the right balance between the ‘control’ exerted through policy and regulation to support embedding against that of ‘freedom’ to innovate. The approaches used to address this issue were as follows:

• Postgraduate training programmes in learning and teaching incorporate modules of technology-supported learning.
• Recognition that as academics become more proficient they will naturally begin to become more self-sufficient and therefore likely to expose themselves less to new ideas and approaches proposed or implemented by others with more experience. This was addressed by ensuring that the ‘proficient’ academics were not neglected in terms of professional development.
• Promoting innovation through sharing good practice through the ‘e-learning Models’ project designed to capture the practice of experts and supported through case studies.
• Refining and institutionally endorsing e-learning models to support their rapid adoption.
• Institutional repository to store, manage and enable the discovery of learning resources and promoting their re-use.

Studies by Davies & Smith (2006), Heaton-Shrestha et al (2005), Moron-Garcia (2006) and Newland et al (2006) all examine different aspects of the effect of using VLEs and e-learning on academic staff, policies, procedures and institutions. Many of these identify the barriers for academic staff to using VLEs and e-learning. Heaton-Shrestha et al, (2005) and Davies & Smith (2006) report workload and a lack of time as a key obstacle for academic staff in their use of the VLE.

A lack of resources now appears to be less of an issue, particularly with regard to infrastructure. However, support and staff development are still seen as barriers by some (Morón-Garcia, 2006; Newland et al, 2006) if only as a drain on time. It is also as an issue for administrative support staff (Davies & Smith 2006), although Heaton-Shrestha et al, (2005) identified that training was specifically highlighted as not being mentioned by the staff who were interviewed.

These studies have reported a number of pedagogic issues, with staff questioning the appropriateness or effectiveness of e-learning (Heaton-Shrestha et al, 2005; Davies & Smith, 2006) or struggling to identify purposeful uses (Morón-Garcia, 2006). In addition, students’ attitudes have also been cited. Firstly, their focus on final assessment rather than learning – if it is not compulsory or graded, then why bother. Secondly, some academic staff are concerned that the use of online activities might adversely impact campus-based ones, for example non-attendance at lectures (Morón-Garcia, 2006; Heaton-Shrestha et al, 2005).

A final common theme across these studies is the lack of recognition and encouragement for these activities; in particular the importance placed on research being greater than that placed on teaching is repeatedly cited:

“…it is still the case that in the majority of institutions, recognition and promotion is linked to research activity rather than innovative teaching developments” (Newland et al. 2006, p. 40)

It is also worth noting the comments of JISC (2008) that Institutional strategies and policies are having difficulty in keeping abreast of changes enabled through Web 2.0 technologies. They use the example of an academic with a thousand plus Youtube and Google videos and resources, waiting for an institutional policy on the use of the resources with students.
3.3 Productivity and Costs

In terms of economic factors, Twigg (2001) was one of few who raised the possibility of reduced costs, but only where e-learning was part of a course re-design process. A brief debate took place in the Association of Learning Technology Journal (ALT-J) over cost-benefit models in 2003. Nicol and Coen (2003a) described the INSIGHT cost benefit model developed with JISC funding (see http://www.strath.ac.uk/learningservices/innovation/projectarchives/insight/), which was critiqued in a response by Draper (2003) with a further response by Nicol and Coen (2003b).

Klonoski (2005) describes the undertakings of a state-wide (Connecticut, USA) collaboration in HE, the Connecticut Distance Learning Consortium (CTDLC), to purchase a VLE (the WebCT platform). The consortium cost can be described in three dimensions: purchase (license), operation (implementation planning, infrastructure, central services, integration, and data centre personnel), and user support (help desk and faculty training). Small and mid-size institutions benefited from joining the consortium through the reduced cost to maintain a data park and regular upgrades. Large institutions can achieve extra revenue from hosting services.

The CTDLC was able to reduce the cost of deployment by more than $250,000 and by working collaboratively, were able to reduce the system's per-user cost, reduce implementation costs, accelerate their learning curve and thereby reduced the time to ‘go live’ and extended opportunities to institutions that might want to join the consortium in the future.

Laurillard (2006) reviewed several articles on the cost of technology-enhanced learning, concluding that there are many different approaches to map the cost of technologies. She categorised different approaches, e.g., cross-institution approaches (Garret & MacLean 2004). Laurillard found that most costing studies focus mainly on the difficulty of costing rather than on the more difficult task of measuring the benefits, and concluded that there is no consistency in costing new technology methods across institutions and no consistency in the parameters that can be used to compare new technology with traditional methods. She attempts to define benefit parameters that can differentiate between old and new methods and gives examples, e.g., comparative benefits, the importance of staff time, the value for the learners, advantage using technology and the benefits in terms of improvement for the learner. She also concludes that it requires much more care to achieve economies of scale in higher education without reducing quality.

Laurillard supports earlier work by Twigg (2002a) who found that there is currently a great deal of uncertainty about the relationships between cost, access and quality in online learning. Can online learning deliver higher education at a lower cost than face-to-face provision? Can online learning replicate or exceed the quality of the face-to-face learning experience? If so, what are the cost implications? Can online learning enable larger class sizes with no loss of quality? Without such redesign, Twigg argues, online delivery will simply add to the cost of face-to-face delivery and the promise of online learning in terms of improved access will not materialise.

Twigg's work is focused on the United States, but she argues that the lessons have relevance for universities and colleges across the world. As ever-more nations move towards mass higher education, higher education institutions are being asked to teach more students for less. At the same time, universities are investing ever-larger amounts in online delivery. Twigg (2002) argues that a way can be found to make online learning a tool to widen access without compromising cost or quality.
Twigg (2002b) suggested that new technologies represent a black hole of additional expense and increase demand on access to hardware and software. Technology becomes part of the problem of cost attainments rather than part of the solution. Universities and colleges have not yet begun to realize the promise of technology to reduce costs of instruction. She argues that in order to take advantage of using technology to reduce cost, there needs to be a fundamental shift in thinking, in terms of challenging the current instructional model. Instead of working harder, academics need to work smarter with a focus on effective and efficient learning, instead of on effective and efficient teaching. She offers a range of general approaches for developing technologically-based learning opportunities that can reduce costs including:

- Use technology to deliver elements of the module where appropriate, and only use academic staff on tasks where their specific expertise is needed. 'Less challenging' elements of the course can be delivered by junior staff.
- Use technologies to enable increased enrolments without increasing the resources required.
- Reduce the number of students repeating modules.

It should be noted that although Twigg (2002) describes the global applicability of her approach it is primarily being used in US institutions with very large class sizes.

Garrett & MacLean (2004) compared pricing of on-campus and majority online MBAs at 25 business schools. The main findings are that there is a wide range of online prices (higher, lower and the same as on-campus equivalents), the absence of explicit pricing rationales, multiple influences on pricing, and often lack of clear and comparative pricing information. Garrett & McLeod (2004) conclude that although you might expect some rationale for the pricing there appears to be no clear consistency of pricing between the majority of online and on-campus provision. Business schools do not appear to put forward any explicit pricing rationale. The pricing behind on-campus or online seems to be lacking in transparency and does not offer an indication as to whether technology-mediated instruction results in lower cost than traditional face to face instruction. These conclusions support those of Twigg (2002b).

From an economical perspective, Morris (2008) reviews the possibilities and limitations of economies of scale and scope for the use of e-learning in higher education. He argues that economies of scale, the spreading of fixed costs—like labour, infrastructure and course development—should be able to decrease with the increase of scale. In addition, centralization of common resources, like research and development, and marketing and recruitment, may also decrease with increased scope.

Morris (2008) describes a key source for achieving economies of scale as the spreading of fixed costs, specialists and the division of labour. Morris describes the key fixed costs in HE as including course development and IT infrastructure. He states though that there is little evidence of significant economies of scale resulting from the implementation of e-learning. He further describes ‘economies of scope’ which are the cost savings that can be achieved through the sharing of ‘inputs’ such as knowledge (e.g., learning objects) and technologies, enabling “efficiencies associated with increasing demand for a range of diverse but related products.” Morris argues that economies of scope can be achieved in HE through “sharing knowledge, pedagogic innovation and re-using course materials.” He contends however that these types of economies are rarely considered, at least explicitly.

However, the HE market is not similar to a consumer goods market, and increase in size may also bring problems for higher education institutions. He describes an example of an economy of scale being introduced through the use of a VLE for the
distribution of course materials, but a subsequent dis-economy of scale through the local printing of these materials. A further example quoted is that of increasing student recruitment by offering a wider array of courses, resulting in a reduced enrolment on existing courses through a displacement effect and even overreaching staff expertise.

Morris (2008) found evidence of economies of scale and scope in e-learning in the globalization of higher education in internationalization, the cross-border trade and ‘flying faculty.’ He warned that economy of scale in cyber universities can have consequences for lowered quality, falling prices and excessive product differentiation. Nevertheless, reusability of learning objects could reduce course development time as well as digital repositories of this materials. Universities can gain by collaboration and partnership, by sharing practice and expertise, cross-pollination and improved decision-making.

Morris (2008) suggested that improving retention and identifying ‘at risk’ learners are high profile issues in higher education, and a proposed solution is to provide good learner support. Blending of online learning with classroom sessions offers the potential to use a virtual learning environment to deliver learning activities, and to support learners using a distance learning model. Online tracking can also help to target ‘at risk’ learners quickly. In an action research project to improve retention, a blended module with proactive tutor support was compared with a previous cohort of the module and with similar classroom-only modules where there was no focus on learner support. Learners were also interviewed and the tutor kept records of the learner contact time. The resulting improved coursework submission rate was attributed to learner motivation as a result of peer and tutor support. The total teaching time was no greater in this model, although the workload distribution changed, and the tutor needed to be highly skilled in e-learning.

JISC (2008) summarised the tangible benefits that emerged from 37 projects they funded through the e-learning programme (see also www.jiscinfonet.ac.uk/case-studies/tangible). They examine types of tangible benefits against online approaches in the form of a graph (see Figure 3.1. below), identifying areas where a return on investment is likely and areas that fall into research and development. The e-assessment projects represent well-defined problems that can be easily automated and have their return on investment calculated more accurately than activities in the R&D zone. They further identify some tentative implications for the HE sector including:

- E-assessment project at the University of Nottingham could be widely implemented across the Business and Health subjects with an indicative £7m saving for the sector in terms of staff time.
- Student achievement gains of approximately 10% which could represent 30,000 additional graduates across the UK sector.
- Clear evidence of improved student retention.
- Schools of medicine and veterinary science are able through e-learning, to increase student numbers without increasing resources. It is notionally estimated that an increase of 1% in student numbers could result in £11m for the institutions concerned.
- Evidence that e-learning can benefit learners with special needs.
Figure 3.1 Benefits of e-learning showing the nature of e-learning problems against e-learning approaches and the associated evidence, metrics and drivers. Drawn from JISC (2008), where the drivers are: **Rational**: time and cost savings; **Pedagogic**: improving student learning and; **Professional**: commitment of academics in tackling complex issues of student engagement.

Bensberg, F. et al (2007) discussed the possibility of analyzing the cost of e-learning platforms with a Total Cost of Ownership model. This model was developed in the late 80s by the Gartner Group (http://www.gartner.com/technology/home.jsp) to determine the cost of owning and deploying PCs. Generally speaking, a cost effectiveness study of a LMS distinguishes three layers:

- **Level A**: the level of provision for the target audience (students who use the LMS) or resource management like hardware, software license, human resources.
- **Level B**: the level of utilization of the LMS, level of efficiency of the LMS in terms of human-computer interaction. This can be measured with tools like the Activity Tracking (provided by Blackboard) and Data Mining.
- **Level C**: the level of result or an analysis of the outcome. This is mostly related to the pedagogical implementation and learner outcome.

The three levels are related to each other by the cost of the VLE, the efficiency of the VLE and the use of the VLE. According to Bensberg, F. et al (2007) scientific papers on VLE mainly have a technical or didactical scope and economical decision-making is mainly based on acquisition and support costs. The two main models to analyse the cost of e-learning are firstly, Learning Scorecard – based on the Balanced Scorecard (a strategic performance management tool) concept. It takes into account the business, customer and financial perspective and becomes visual in, for example, the cost per student...
or cost per course. A second model is the Calculation Object Model (COM) which focuses on the cost to write and design learning objects. Both methods have limitations.

The concept of Total Cost of Ownership (TCO) is a method to describe all direct and indirect costs of a certain infrastructure. Direct costs are the costs for direct support of the VLE like hardware and software and IT support. Indirect costs are staff training, self training, and customization. The limitation of the model for the VLE has to be found in the difficult task of measuring indirect cost of students use and efficiency, as well as the difficulty in measuring the human resources, use and efficiency by academic staff (and other staff who are involved).

Linsey, Katsifli and Gipps (2005) identified the direct costs of implementing Blackboard software at Kingston University. The costs of implementing an enterprise installation of a Blackboard system in September 2001 through to December 2003 to support 22,000 staff and student users were as follows:

- Average yearly cost for hardware/software/integration work: £136,000
- Total yearly support staff costs: £255,000

Over the period of the study the annual cost per user was calculated as £6 plus an additional £12 per user for covering all support staff costs.

Ruth (2006) describes the growing business of distance education at USA universities, and compares costs between the University of Phoenix, USA and the Open University UK. He concludes that there are financial advantages to offering distance learning. Universities in 2004 offer distance learning to almost two million users in the USA and this is increasing with 25% annually. Traditional universities seem to be cautious about adopting this approach because, according to Ruth (2006) only a third of all distance learning courses in the US are accredited by professional bodies. Academic staff are sceptical of investing much time or effort in developing online learning courses, believing the effort to be low in yield both financially and intellectually.

Ruth (2006) argues, however that offering distance learning can have benefits; it could save on overhead, bricks and mortar and staff time. He sees a number of possible options for traditional institutes to embrace more distance learning: investigate mergers and integrations with other institutes; establish a globally oriented virtual university (one large university instead of many small ones); Invest in blended learning instead of bricks and mortar; and accept investment in e-learning as inevitable.

Fielden (2002) suggests that there are common questions university managers ask about e-learning. These are: How to cost it? How much does it cost? Is it cost-effective? Using studies from the USA and the UK Fielden demonstrates how these questions have been answered in these studies, and provides some actual figures for e-learning products developed for use on campus and for the international market. Evidence of costs is also cited from the commercial world. The complexity of undertaking a professional costing is outlined, and a simple checklist of resources is shown for those wishing to embark on an in-house study. In an environment where the web is becoming a central part of most students’ learning experience, it is reasonable to ask whether it is necessary to cost this as an innovation. Fielden (2002) offers a range of costing models but suggests that if development time is fully costed, then online learning can seem more expensive than traditional teaching.
The paper concludes by suggesting that institutional energies might be better spent setting out clear policies for ensuring that staff time spent on developing online materials is used effectively. However, cost savings are achievable if courses with larger enrolments are carefully designed to accommodate online learning.

McCord (2006) describes the focus of staff development in educational technology at the Lawrence Technological University in the USA for academics who were involved in the development of fully online degree courses. Key elements to success included: individual tailoring, online introduction course to pedagogical and technical aspects of online teaching, a whole product approach, support from e-learning developers and shared resources as well as video-on-demand training. McCord (2006) argues that a new commitment to training is necessary since past models of acquainting faculty with available technical resources are no longer adequate.

Wach (2007) described the changes in staff development on learning technologies from 2003-2006 at Bronx Community College, USA. Staff development in learning technology progressed from basic training on software skills in a two-hour workshop, a model that worked well for early adopters. However, after the installation of the Blackboard system it became apparent that this model did not suit the new training needs. A 15-week course with weekly learning objectives was started. The difference between experienced users and less experienced users became clear in this course. Experienced users had a tendency to go beyond the material in the course. In summer 2006, a summer camp was organised for a select group of staff from different departments. Afterwards members of this group became peer mentors in their departments. This group had a good impact on the development of more hybrid and fully online courses.

3.4 Learning and Teaching Strategies

There is a growing body of evidence about the impact of online learning on institutional teaching and learning strategies. Bricheno et al (2004) concluded that of the 20 institutions studied, 11 had developed separate and specific e-learning strategies, while 8 were addressing e-learning within their central teaching and learning strategies. One institution had no strategy at all for e-learning. Within these e-learning strategies, there was an increase in staff development with a focus on effective use of networked learning. Uptake, however, was found to be problematic.

Bricheno et al (2004) also found that senior managers were creating key strategies for networked learning but the effectiveness of these is not consistent, and in some cases, is problematic. The most successful institutions are those that combine a top-down and bottom-up approach to the implementation of networked learning. Having central support units in the institutions appears to be effective. However, academic staff attitudes are crucial to the successful implementation of networked learning, and in changing the central teaching and learning culture of the organisation. MacKeogh & Fox (2009) similarly recognised the need for top-down strategies while noting that academic acceptance and engagement is crucial to successful implementation. They further noted the importance of political support from senior managers.

JISC (2008) make the point that:

"Institutional strategies are useful in providing a long-term vision and top-level support for initiatives that improve learning and teaching but they are rarely the key drivers for innovation. Many innovations are still
The Impact of Blackboard Software on Education Globally Over the Past 10 years

However, Bricheno et al (2004) also found little evidence of changes to the role of the teacher, and there was no obvious move to student-centred learning even where e-learning was becoming established. The technology had not produced innovative approaches to learning. In reality, networked learning was being used mostly to address the widening participation agenda. What was needed, according to Bricheno et al (2004), was a clearer institutional vision of teaching and learning supported by strategies and structures, and training and staff development.

Salmon (2005) also argues that there are two approaches to the introduction of e-learning. One is through large-scale centralisation and delivery of services or alternatively, incrementally involving all academic staff via easily accessible technologies and appropriate training. It is further argued that although the latter approach is potentially more challenging, it supports capacity building and local ownership. Salmon offers a quadrant-based framework to implement e-learning and pedagogical innovation addressing research into innovative pedagogy, development of core and peripheral technologies, business models, institutional culture and wider frameworks and directions.

Sharpe et al (2006) describes the e-learning strategy at a single HE institute (Oxford Brookes University in the UK). The e-learning strategy had several main aims. It stimulated a discussion within each school, and from each school the e-learning champions or early adopters wrote a strategy to ensure ownership, locality and relevance. Each school received the support of a learning technologist. The strategy had a strong relationship with general staff development in each school. According to Sharpe et al (2006) it stimulated a massive take-up of the WebCT platform and stimulated local projects in the schools. Additionally, institutions identified as successful implementers of blended e-learning had highly contextualised and specific rationales for their adoption.

In recent years a number of pedagogic planning tools have been developed to support academics in the design and planning of effective learning resources, including in the UK. Examples of such tools are:

- Phoebe (http://phoebe-app.conted.ox.ac.uk/about/) is a template-based system for designing learning and teaching sessions with context-specific guidance provided through a linked wiki, e.g. for writing learning outcomes and designing learning activities. For instance, the section on “What Technology Can I Use For...” covers a range of technologies that can be incorporated into different activities including mobile technologies, wikis, blogs, podcasting, virtual worlds, etc. (see http://phoebe-guidance.conted.ox.ac.uk/wiki/PhoebeMapActivitiesToTechnologies). Users can develop their own templates and share and re-use others across the academic community.

- London Pedagogy Planner (http://www.wle.org.uk/d4l/) can be downloaded as a desktop application, and like Phoebe, it was developed through a JISC funded project. The tool is also linked to the Phoebe context specific guidance wiki. The template-based approach is interactive and includes a calendar component and the ability for staff to break down the number of hours allocated to teaching approaches used (e.g., lecture, tutorial, independent inquiry, etc.). The system will then calculate the estimated hours students will spend on particular cognitive activities (e.g., attention, inquiry, practice) for each teaching approach. The tool can be used at the individual session level and also at the module level.
• Learning Design Support Environment (https://sites.google.com/a/lkl.ac.uk/ldse/) is an ongoing follow-up project to the London Pedagogy planner with an aim “to scaffold teachers’ decision-making from basic planning to creative Technology Enhanced Learning design” (LDSE, 2009).

• CompendiumLD (http://compendiumld.open.ac.uk/) was developed by the Open University in the UK as a specialist implementation of the Compendium mind mapping environment. The environment is therefore a very visual design environment and can be downloaded as a desktop application.

These tools have the potential to help academic staff develop new pedagogic approaches supported through technology in support of institutional e-learning strategies but the true test will be whether they extend beyond staff development events into everyday practice.

3.5 Further Reading

Institutional Learning and Teaching Policies and Procedures


Productivity and Costs


Learning and Teaching Strategies


4.0 Current VLE Debates and Potential Future Directions

This section will explore the expectations, developments and debates around the VLE in order to examine what the experts are thinking about the continued use of an integrated set of tools, such as the Blackboard Learn system, versus using a set of disaggregated tools. What will the role of the VLE be in the future? In view of the growing trend for open courseware, how will Blackboard software be used alongside open courseware?

4.1 Development of educational practice, changing pedagogical models and consequences for the VLE. Distance Learning, skills-based learning, competency-based learning, lifelong learning.

4.1.1 Developments in social media and the impact of Web 2.0 on the use of educational technology in the classroom

In the UK an independent Committee of Inquiry into the impact on higher education of students’ widespread use of Web 2.0 technologies, JISC (2009), identified a number of critical issues facing higher education, including:

- Information literacy, ensuring that students have the skills and understanding to be able to effectively use and assess materials from a range of resources including the web. It also points out the importance for staff in maintaining their currency of skills in terms of web-based information.
- The connection between Web 2.0 environments for social purposes and its use in learning is only perceived at a basic level by students and staff.
- Web 2.0 tools are well disposed to supporting active learning and can support the development of a learning community.
- Group based work supported by technologies in schools is likely to change expectations of higher education.
- The importance of communication, participation, networking and sharing skills are becoming essential for learning and employment, and Web 2.0 tools have an important role to play.

The report provides a warning for higher education that for the student:

“The world they encounter in higher education has been constructed on a wholly different set of norms. Characterised broadly, it is hierarchical, substantially introvert, guarded, careful, precise and measured. The two worlds are currently co-existing, with present-day students effectively occupying a position on the cusp of”
change. They aren’t demanding different approaches; rather they are making such adaptations as are necessary for the time it takes to gain their qualifications. Effectively, they are managing a disjuncture, and the situation is feeding the natural inertia of any established system. It is, however, unlikely to be sustainable in the long term.”

Stiles and Yorke (2006) further make the point that ‘centralised control’ will become more difficult for institutions with academic staff and students building their own tool sets using both institutional and third party personal and web-based tools. They further add that students will increasingly implement their own sharing and collaboration environments externally to the institution and involve individuals beyond their modules and courses.

MORI (2008) concluded from investigations of student expectations of HE that students are ‘digital natives’ having grown up with technologies. In addition, students have an expectation of using their personal technologies on entering HE which is reflected in follow-up investigations of students studying in their first year.

Owen et al (2006) explored the inter-relationship between two key trends in the field of educational technologies. In the educational arena, we are increasingly witnessing a change in the view of what education is for, with a growing emphasis on the need to support young people not only to acquire knowledge and information, but also to develop the resources and skills necessary to engage with social and technical change, and to continue learning throughout the rest of their lives.

There has been much written on the use—actual or potential—of Web 2.0 tools/social media in higher education (Anderson 2007; Armstrong & Franklin 2008; Johnson, Levine & Smith 2009; Owen et al. 2006; Selwyn 2009). Generally, such tools and environments are perceived to offer very different user experiences and affordances to those of the VLE. For example, Hughes (2009) argued that:

“We have deliberately chosen not to regard Virtual Learning Environments (VLEs) as Web 2.0 technology. VLEs, software systems that provide a collection of tools for such functions as communication, uploading content, assessment — including peer assessment — and administration of student groups, are powerful resources and we know that students value them greatly. Essentially, however, they are systems that have their locus in individual institutions. Their management and direction are firmly in institutional hands and, moreover, they generally operate only in the environment of the particular institution. They are closed rather than open systems. This is not to say that VLEs lack the capacity to be developed and implemented as more open systems; rather that they tend not to be deployed by HEIs in that way at present.” (Hughes 2009: p. 15-16)

Franklin & (2009) cited Ning as an interesting example of a Web 2.0 environment which allows users much greater control over access to users and what facilities are made available to them than the tutor-centric VLE. The report claimed that “We are beginning to see this being used in learning and teaching as an alternative to the institutional Virtual Learning Environment.” (Franklin & Armstrong 2009: 8). The report concludes that:

“The monolithic VLE tools provide little scope for the wider ranging ambitions of innovators and those who want their students to work with enquiry led approaches. Web 2.0 tools offer much more potential for innovation in learning, teaching and assessment.” (Franklin & Armstrong 2009, p. 34)
Franklin & Armstrong (2009) support Hughes (2009) arguing that the VLE tends to be controlled and pre-determined by teaching staff. However, students are likely to want to work in virtual places that are familiar to them, with access to their institutional work accessible even after leaving an HEI. The ‘closed world’ of old VLEs which is, now becoming a problem within HE provision, may change (Franklin & Armstrong 2009, p. 34). This argument is also supported by Coopman (2009).

Each of the main commercial Learning Management Systems (LMS), as VLEs are often called, are now incorporating Web 2.0 features. Having such tools in the VLE means that they are all available in a single place, with reduced support costs and simplified access. Because use is member restrictive (such as for example, to those undertaking a course), control of licensed resources is also significantly simpler, reducing concerns of inappropriateness.

Franklin & Armstrong (2009) also suggest that restricted access is at the same time disadvantageous, as it can be problematic getting visiting lecturers or guest experts the necessary permissions to use the system. Keeping Web 2.0 within the VLE additionally suggest that it infringes on students’ informal learning and social spaces (which may be seen as advantageous, but anecdotal evidence suggests that many students are ignoring the provision of Web 2.0 features in the VLE to use the systems that they prefer, such as Facebook, MySpace, etc, (Franklin & Armstrong, 2009, p. 37).

4.1.2 Web 2.0 and changed learning paradigms

Redecker (2009) reports on a study aimed to evaluate the projected impact of social computing on learning and to analyse its potential in supporting innovation and inclusion within education and training. The primary goal of this review of practices was to collect evidence and summarize published research findings on the ways in which social computing applications change learning patterns, give rise to new learning opportunities and impact education and training (E&T) organisations.

The report supports specific beliefs about the nature of learning within social computing applications. Redecker (2009) suggests that learning is fundamentally collaborative in nature. Social networks arise around common interests and aims, and facilitate the learning process by providing social and cognitive guidance and support. The learner plays a central role in the learning process and is an active author, co-creator, evaluator and critical commentator. Learning processes become increasingly personalised, tailored to the individual’s needs and interests.

According to Redecker (2009) the take-up of social computing in education and training is in an experimental phase. However, current practice reveals four separate but overlapping innovative ways of deploying social computing tools. These are:

- Learning and achieving - used to directly support, facilitate, enhance and improve learning processes and outcomes. Social computing as means to personalise learning processes and promote individual learning progress, leading to an empowerment of the learner.
- Networking - used to support communication among students and between students and teachers, establishing a social network between and among learners and teachers.
• Embracing diversity - integrating learner into a wider community—alternative channels for gaining knowledge and enhancing skills.

• Opening up to society - tool for making institutional learning accessible and transparent for all members of society, promoting involvement of third parties like parents and prospective students.

Redecker (2009) also argues that social computing can foster pedagogical innovation in a number of ways, e.g., through the supply of, and access to, learning material; through personal knowledge management and resource network building; through subject-specific methods and tools; by improving personal achievement; by developing personal affective and social skills; and through developing higher order skills and meta-competences.

Stiles and Yorke (2006) argue that it is crucial for institutions to review centrally supplied services and assess how student generated activity can be linked or integrated with these systems.

4.1.3 Virtual Learning Environments and Personal Learning Environments

A trend identified by Johnson, Levine & Smith (2009) is what the authors describe as ‘the personal web.’ This is defined as:

“a collection of technologies that confer the ability to reorganize, configure and manage online content rather than just viewing it”

Johnson, Levine & Smith (2009, p. 19)

Johnson, Levine & Smith (2009) describe personal webs as self created and consisting of online tools that suit each individual’s unique preferences, styles and needs. Digital tools and environments cited as typical of the personal web include blogging sites such as WordPress and EduBlogs, as well as tools like Twitter, Facebook, YouTube, and Flickr. Amongst academics with an interest in educational technology the term ‘personal learning environments’ (PLEs) tends to be used.

Wilson, et al. (2007) argues that the VLE is the dominant technology in higher education. Current systems used in education follow a consistent design pattern, not supportive of lifelong learning or personalization, a design that is asymmetric in terms of user capability, and which is disconnected from the global ecology of Internet services.

Representative of recent debates about PLEs – currently taking place mainly in the academic blogosphere rather than in peer-reviewed publications – was a discussion at the Association for Learning Technology’s annual conference held in Manchester, UK in September 2009. Provocatively, the conference was entitled, ‘The VLE is Dead’. The key point of the session is summarised below and encapsulates many of the key issues debated more widely elsewhere.

The session was primed in advance by an online debate using blogs and Twitter and continues online. Prior to the discussion at the conference, other writers were influential in the debate. For example, Stiles (2007) argued that the VLE had become mature over the years but that it developed more and more as a Managed Learning Environment (MLE), or e-framework that bolted together systems like e-assessment, e-portfolio and the portal and replaced the function of what many institutions would have had as separate systems.
VLEs have become less innovative, do not embrace the new Web 2.0 development, and with the latter, more and more learning takes place outside the institutional control. Because of this, institutions need to reconsider their policies and strategies and reflect on the needs of the learner and institution. New systems that allow interoperability between different systems “could be ‘slimmer’ than most current VLEs, and whether it will still be considered to be a VLE remains to be seen.” (Stiles 2007, p.35).

Leslie (2007) asks others to explore the possibility of using contemporary social software/Web 2.0 tools outside a course management system. Weller followed that up with a 2007 blog post entitled, “The VLE/LMS is dead,” and explored the opportunities of the social web. He summed up the pros and cons of a VLE, concluding that the VLE will be replaced by “freely available third party systems” (Weller 2007 at nogoodreason.typepad.co.uk/no_good_reason/2007/11/the-vlelms-is-d.html).

At the live session of the conference Wheeler, referring to an earlier paper (Wheeler, 2009, at http://steve-wheeler.blogspot.com/2009/08/two-fingered-salute.html) began the debate arguing that the VLE is not fit for purpose: “VLEs have been designed by businesses not by teachers” (Wheeler, 2009) and that the VLE was developed as a management tool for online learning. The VLE is a Content Management System (CMS) that controls users and their learning. The “VLE has essentially a common architecture and purpose: it is there to restrict access, deliver homogenous content and control the activities of its users” (Wheeler, 2009, at nogoodreason.typepad.co.uk/no_good_reason/2007/11/the-vlelms-is-d.html).

Wheeler went on to suggest that the VLE embodies a ‘one-size-fits-all’ approach, is inflexible and militates against personalisation, ownership, and fit with students’ preferred learning styles. The VLE, it is claimed, does not allow more discursive types of learning and prevents discussions and learning outside the university boundaries.

Wheeler suggests that the PLE is more supportive to learning and more economical because it is freely available. Most importantly, however, the personal web has a key advantage in that it is owned by the individual who created it (Wheeler, 2009). The VLE, on the other hand, has used a “vast amount of money that has been poured into providing tools which are just not being used appropriately or effectively” (Wheeler, 2009, at nogoodreason.typepad.co.uk/no_good_reason/2007/11/the-vlelms-is-d.html).

Wheeler concludes that the institutional VLE is led by the entire institution and, consequently, is slow to respond to change. The PLE, on the other hand, is led by one user. The VLE is insufficiently flexible and versatile in the face of the challenges presented to it by the personal web.

Attwell (2009) also argued against the VLE, mainly on the grounds of its implicit support for conventional pedagogic modes. VLEs, he claims, tend to mimic existing paradigms and support a standardised curriculum. Attwell views the VLE as a system to “manage” learning. It has a strong focus on efficiency and standardisation and as a result, the use of technology for learning remains similar to traditional delivery of knowledge. This does not stimulate learning, but rather supports an economy of scale in, for example, distance learning. Attwell (2007; 2009) suggests that the VLE is also exclusive, locking out those who are not registered on courses, and making the content and courseware unavailable to others. Atwell links the exclusivity of the VLE with the Open Course Ware debate; Open Content democratizes learning and makes learning possible without the need for formal enrolment and accreditation.
Atwell (2009) still sees the potential for transforming technology-enhanced learning. It has the ability to support learning through exploration for anyone and anywhere. The social web creates the opportunity for supporting work-based learning and informal learning that takes place outside traditional courses. From this perspective, the notion of the Personal learning Environment (PLE), is a better use of technology and suits the needs of diverse learners (formal or informal) and better stimulates ownership by the students:

“PLEs provide opportunities for learners, offering users the ability to develop their own spaces in which to reflect on their learning” (Attwell 2009 at http://learning101.posterous.com/for-elearning-vle-is-dead-ple-is-in-a-right-p)

Clay (2009) argued the case for the VLE by highlighting its main strengths: It is ‘quick and easy’ for most students and lecturers to use; most students, far from being ‘digital natives,’ are not familiar with Web 2.0/social media technologies. Clay claims that many students do not know how to use the web effectively (Clay 2009). The so-called Google Generation do not use Web 2.0 more than others, or even have the skills to use it in an educational setting. “These learners they need guidance and advice on what tools they should use” (Clay 2009, at http://elearningstuff.wordpress.com/2009/08/10/its-not-dead-yet/).

Clay (2009) suggests that students and educational professionals need to build up the confidence to use the social web and that the VLE could be a starting point for doing this. In addition, he argues that simply because an institution uses a VLE, this does not preclude using other Web 2.0 services and tools. Rather, a VLE and web tools can be used together (Clay 2009). Clay sees the VLE as a transitional tool that could disappear over time, suggesting that all tools are eventually replaced by new ones. However, he concludes that at the moment, institutions cannot afford to bury a tool that for some people is a starting point on their learning journey (Clay 2009).

Sharratt (2009) defends the VLE on the basis that it is a stable, reliable and safe environment for the learners. Students do not ask for a high level of novelty. Rather, they prefer a predictable learning environment. Students and lectures are limited users of the Web 2.0 and the students are not pushing for new ones. The core business of every university is teaching and learning and IT departments should provide a coherent framework to do so. An integration of all kinds of tools could easily result in a chaotic learning environment; the VLE offers structure and makes navigation safe. Sharratt (2009) sees the VLE as a product in development with its shortcomings needing to be addressed.

In conclusion, the debate about the ‘VLE is Dead’ could be seen as a debate that started as a reaction to the development of the personal web and its possibilities for the personalisation of a learner’s technological toolset. PLEs create new learning opportunities in which collaboration, feedback and informal learning plays a more central role. It supports forms of teaching and learning which are less teacher-centred and more student-centred. From this context the debate is related to a wider debate on the changing pedagogic practices of higher education globally.

4.1.4 Open Course Ware and the VLE

In recent years a number of higher educational institutions from around the world have begun to debate ways in which educational resources might be made more widely available to learners who are not formally enrolled on their courses. Sometimes known as open educational resources (OER), the most prominent manifestation of this trend is the so-called
OpenCourseWare Consortium (http://www.ocwconsortium.org). Their three key principles, according to Abelson (2007), are that content:

- is free, open and of high quality
- is available for use and adaptation under an open license
- does not typically provide certification or access to teaching staff

Typically, such course materials are available in digital forms through the Internet and are comprised of lecture notes, readings, assignments, exams and video or audio resources, including podcasts. Such resources are often described as ‘learning objects’ or ‘reusable learning objects’ (RLOs) about which there is a significant amount of research, although not all of it in the context of OpenCourseWare. Generally, materials provided through OpenCourseWare websites may only be used for non-profit educational purposes, but as long as this is the case, the materials may be freely used, copied, distributed, translated and edited.

The search of publications on the relationship between VLEs and OpenCourseWare has revealed that there is no current published research. Those publications that have addressed this relationship have done so tangentially and have concluded that the underlying logic of VLEs mitigates against the principles of OpenCourseWare. For example, Cousin (2005) argues that VLEs, insofar as they require user authentication to access, are ‘walled gardens’ that work against the ethos of the OpenCourseWare. She writes that:

“Though the online medium can allow forays into unchartered territory, there is a level at which the VLE pulls up the drawbridge, enclosing the student and tutor within a familiar university building. [...] … the identities encouraged by VLEs derive from a protectionist view of the university as the centre and controller of knowledge production”. (Cousin 2005, pp. 122-123)

However, one can make the counter argument that the restrictions on using a VLE to make content more freely accessible have less to do with the technological limitations of the VLE and more to do with licensing arrangements with the commercial VLE providers and, perhaps most important of all, continued concerns by academics about their intellectual property rights.

### 4.2 Mobile Learning and the demands on the VLE

Johnson, Levine & Smith (2009) identifies mobile learning as one of the key trends to watch in higher education over the next few years. They highlight the rapid evolution of the mobile from simple telephone to a convergence device that has the ability to run third-party applications and is location-aware, "making it an ever more versatile tool that can be easily adapted to a host of tasks for learning, productivity, and social networking” (Johnson, Levine & Smith 2009, p.4).

Much of the research on mobile learning initially focused on the mobility, or portability, of the technology (Kukulska-Hulme & Traxler 2005), but has moved more recently to recognize the primacy of the mobility of the learner and his or her learning (Sharples, Taylor, & Vavoula 2007). Some have defined mobile learning as taking place when the learner is not in a fixed, predetermined location, but acknowledge the importance of “the learning opportunities offered by mobile technologies.” (O’Malley et al. 2005, p. 6).
This shift in focus from the portability of technologies to the mobility of learners is also noted by Seppälä & Alamäki (2003) in their clarification of mobile learning as a form of flexible learning where the “mobile environment integrates studies that take place on campus, at home or outside universities facilities into one shared, flexible learning environment.” (Seppälä & Alamäki 2003, p. 330). Traxler (2009) has identified the emergence of a blending of “a physical space and a virtual space of conversational interaction, and an extension of physical space through the creation and juxtaposition of a mobile ‘social space’” (Traxler, 2009, p.7).

Patten, Arnedillo Sanchez and Tangney (2005) have produced a framework for classifying educational uses of mobile technologies which demonstrates that many documented case studies of mobile learning to date relate mainly to administration functions (such as calendaring and timetabling), reference functions (such as e-books and dictionaries), and interactive functions (such as response and feedback activities) (Patten, Arnedillo Sanchez and Tangney 2005). They argue that the theoretical underpinnings of these activities appear to be either non-existent or principally behaviourist in nature, and that the primary benefits of mobile learning can be gained, through collaborative, contextual, constructionist and constructivist learning environments in which peers interact in the co-construction of knowledge. This contrasts with earlier interpretations of mobile learning as being about the delivery of course content to students’ portable devices (e.g., podcasting).

Very little of the research published on mobile learning addresses the relationship between the mobile learner, and his/her portable technologies, and institutional VLEs. Indeed, insofar as the VLE is mentioned at all, it is to contrast new and emerging theories and practices of mobile learning with ‘conventional’ e-learning “exemplified technologically by the rise of virtual learning environments” (Traxler 2009, p. 1) and their implicit ‘gatekeeper’ approaches to knowledge.

4.3 Further Reading

Development of educational practice, changing pedagogical models and consequences for the VLE. Distance Learning, skills-based learning, competency-based learning, lifelong learning.


Open Course Ware and the VLE

5.0 Case Studies

The purpose of the following three case studies is to provide an in-depth view of important findings (that have already been included in the report but only briefly) in the three areas of:

1. Institutional Strategy
2. Lecturers’ perspective
3. Students’ perspective

5.1 Case Study 1: Institutional Strategy

Technology supported learning – Tensions between innovation, and control and organisational and professional cultures
Mark Stiles and Jennifer Yorke
2006
Journal of Organisational Transformation and Social Change, 3,3, 251-268

The University of Staffordshire started to implement an institutional educational technology infrastructure in 1997. This paper describes the journey they took through to 2005 to embed technology supported learning across the institution describing the strategies they implemented and the lessons that they learnt. This is particularly useful as they were one of the earliest institutions to do this in the UK.

They identified that this embedding was a complex process which involved addressing strategy, policy and organisational practice, taking place in a wider context of political and economic drivers. They postulate that strategies that result from these wider external drivers often underestimate the required changes needed on an institutional scale. They further highlight that there is a tension between control exerted through strategy and policy, and that of promoting innovative practice.

In an analysis of published learning and teaching / e-learning strategies they identified three typical strategies:

- Funding projects by innovators
- Top down ‘revolutionary’ change driven by a directive central strategy
- Make the technology available and promote take up
Particular issues they identified with such strategies included:

- Failure to address change management
- Little evaluation
- Failure to learn from experience as an organisation
- No consolidation of progress made

A number of development stages are described at Staffordshire University:

1. In 1996/7 a new learning and teaching strategy was implemented focussing on student centred learning and resource based learning. This was supported by encouraging enthusiasts to apply for funding for projects related to the strategy. Resulted in localised impact.

2. Schools were required to produce local strategies aligned with the central strategy. Schools were then asked to submit projects for funding that aligned with their strategy which would then be subject to central approval. In the period up to 2002 they identified that there had been widespread use of the VLE, significant change in culture and a higher profile for learning and teaching. They felt however that the institution was not ‘learning as an organisation’ and that although all the schools and faculties/departments were engaged, involvement was still localised and there was much re-invention of the wheel.

3. Launch of an ‘integrated development’ approach in 2002. Fundamentally this focussed on identifying the right people in the institution, agreeing their roles and responsibilities and making clear the support that was available to them. This was coupled with a review of policies and procedures within the institution that affected technology supported learning. The result of this was embedding e-learning into the institutions planning processes and reviewing quality assurance processes. They argue that this gave overall coherence to the institution’s approach to e-learning but there were still issues with regard to its embedding in university procedures such as course approval and the way in which the re-use and re-purposing of materials is promoted.

4. Development of an e-learning policy with 10 core principles to act as an enabler and also to provide the ‘rules’ for engaging in technology supported learning covering:
   - flexible and independent learning; informal and individual learning
   - equity of opportunity and alignment of student support
   - provision of a learning environment encompassing all of the learning experience
   - support of independent and lifelong learning and continuing professional development
   - access to eResources from point of need; repurposing and reuse
   - robust quality assurance/enhancement with scope for innovation and employment of professional skills
   - encouragement of research, scholarship and development in eLearning
   - appropriate staff development, to ensure understanding of others’ roles
   - practice, policy and strategy are responsive to lessons learned and new opportunities; removing barriers that impede or restrict effective eLearning
   - resources and support are appropriate to requirements and understood
     (Stiles and Yorke, 2006)

5. They argue that this approach was largely successful with a significant increase in technology- supported learning and with e-learning embedded in corporate policies.
6. Implemented the e-learning models project. The aim was to capture the practice of e-learning ‘experts’ and then embed these models in formally accredited e-learning modules and in the integrative development process with a key purpose of sharing good practice. They state that this approach has been successful in building a large community of practice including external ‘experts’. They also describe a development to provide formal university endorsement for particular models to promote their adoption. They are further examining the implementation of an institutional repository for learning and teaching content.

The paper also considers the changing environment beyond the institution and the role of Web 2.0 tools and environments. The point is made that ‘centralised control’ will become more difficult for institutions with academic staff and students building their own tool sets using both institutional and third party personal and web-based tools. They further add that students will increasingly implement their own sharing and collaboration environments externally to the institution involving individuals beyond their modules and courses.

It is also argued that it is crucial for institutions to review centrally supplied services and assess how student generated activity can be linked or integrated with these systems.

5.2 Case Study 2: Lecturers’ perspective

**Hybrid structures: Faculty use and perception of web-based courseware as a supplement to face-to-face instruction**

Woods, R., Baker, J.D. & Hopper, D.

2004

Internet and Higher Education, 7, 281–297

This article explored how far the Blackboard platform facilitates and supports a blended learning approach by investigating its use and impact on three areas of teaching and learning:

1. The Blackboard platform as a course management tool, used as a space to provide lecture notes, slides and other supportive learning materials as reading lists, syllabus, additional readings and external links. Also the use of the Grade Centre, the Test Manager and the Assignment tools belong partly too this area.

2. The Blackboard platform as an assessment/instructional tool. How far does the Blackboard platform foster diversity, and stimulate critical thinking and support different learning styles before or after a face-to-face session? Specific features in this area are the discussion board and test manager.

3. The Blackboard platform as a tool for Classroom Community. How far does the Blackboard platform stimulate building-up relationships and interaction between course members?

In order to answer these questions a survey was conducted and sent to 50 colleges and universities in the spring of 2003 in a Midwest state of the USA (all institutions addressed were using Blackboard software). The survey was completed by 862 members from 38 institutions; 59% of the respondents were male, and the majority of all respondents considered themselves as somewhat or very computer literate. Almost half had taught with Blackboard software and a substantial majority (83%) had received training or assistance to use the Blackboard software. The main reasons given for using the Blackboard platform were:
• Professional interest (65%)
• Encouraged by colleagues (27%)
• Encouragement of students (11%)

The findings indicate that the dominant use of the Blackboard platform is in the area of course administration. For example:
• 75% frequently published their syllabi
• 81% sent frequent or occasional emails to the entire class
• 59% used the grade centre

Less frequent use was made of the assignments tool (28%). However 41% of respondents had administered a quiz and 45% had used a discussion board to facilitate debate and collaboration.

The Blackboard system was used less frequently as a pedagogic application. For example, participants indicated occasional use of the discussion board to continue in-class discussion or to promote discussion prior to a face-to-face session. Twenty-two percent used the group tools to divide students into discussion groups and about six percent used the live chat or virtual classroom feature to discuss course content online.

The majority of the correspondents are somewhat neutral towards the expectation that the Blackboard system can foster a classroom community. Less than 11% indicated that the Blackboard system was used to develop a stronger sense of classroom community and the majority (60%) indicated they never used the Blackboard system for this purpose.

In conclusion, the Blackboard platform seems predominantly to be used as an administration and management tool as part of a blended learning approach. The majority of the participants never used Blackboard software for more interactive course functions such as formative assessment and for virtual office hours. The study suggests that the Blackboard system seemed to be used to supplement traditional face-to-face instructions.

Further comments

Although the case study dates back to 2004 it has been selected here because (a) it is comprehensive and (b) even the most recent research is in accord with these findings (e.g., Lonn & Teasley, 2009).

In the study discussed here, Woods et. al. (2004), the Blackboard system was examined from a blended learning perspective with perhaps a lesser perceived need to use the VLE to foster a sense of community. It would also be expected that the use of the Blackboard system's functionalities may differ in other contexts such as in distance learning. Other papers also show the predominate role of the VLE as a course management/administration tool; see for example Griffiths & Graham (2009), West et al (2007) and Lonn & Teasley (2009). Griffiths & Graham found in their study based on data mining on the entire campus of Brigham Young University, USA, from one full academic year (2004-5) that instructors used the Blackboard system mostly as an administrative tool.

This study should also be considered within the context of University policy and strategy and managing change – see for example the Stiles and Yorke (2006) case study.
References


5.3 Case Study 3: Students’ perspective

Saving time or innovating practice: investigating perceptions and uses of Learning Management Systems
Stephen Lonn and Stephanie Teasley
2009
Computers and Education, 53, 686-694

This study does not focus solely on student perceptions but also covers academic staff perceptions. It makes particularly interesting reading as the study is based on an institutional implementation of a non-commercial VLE, Sakai, and so it is interesting to see whether the perceptions of students and academics are going to be different than those found in the use of commercial VLEs.

The authors make the point that VLEs are used mostly for the distribution and storage of materials though they can be used for promoting interaction and engagement, through tools such as discussion boards, chat rooms, wikis and blogs. They further point out that these tools allow a VLE to support constructivist approaches to learning and teaching. A key issue however is achieving student and academic staff recognition of the opportunities provided by the available tools. They report that at the University of Wisconsin (Morgan, 2003) academic staff reported that once they had used the VLE they did begin to re-structure their courses and eventually their pedagogic approach. They also argue that there are a number of other similar studies but there has been a lack of longitudinal studies which might identify how students and academic staff change their beliefs and approaches to the effective uses of technology in learning and teaching.

The study is based at the University of Michigan where they note that academic staff development on e-learning is voluntary and the use of the VLE is not compulsory over most of the institution.

They addressed a number of questions / issues:

• Does information technology improve teaching and learning?
  » No significant difference between students and academic staff in terms of IT expertise.
Significant difference with regard to the use of IT. Students reported preferring a higher level of IT use than academic staff.

- Which of the following benefits from using IT in your courses was most useful to you: Content sharing, Assignments; chat, announcements; schedule, discussion, wiki, syllabus?
  
  - There was a significant difference between academic staff and students. The most popular response from academic staff was that it improved their communication with students, and for students the most popular response was that it saved them time (was more efficient).
  
  - The top four functions selected by students and academic staff as ‘very valuable’ were the same, if in a slightly different order, covering Content sharing, announcements, syllabus and schedule.
  
  - When examining system event log data this seems to match the questionnaire data with 95% of activity being linked to content, assignments, announcements, schedule and syllabus. Only 5% of hits were associated with interactive tools – chat, discussion board and wiki.

- Efficient communication and teaching and learning activities. Respondents were asked to rate specific activities categorised as either ‘efficient communication’ (e.g. posting/accessing a syllabus, sending / receiving an announcement) or ‘supporting learning and teaching’ (e.g. students post questions before a lecture, post / access lecture notes after the lecture).
  
  - Academic staff tended to rate ‘efficient communication activities’ as ‘very valuable,’ more so than students.
  
  - Teaching and learning activities tended to be rated as ‘valuable’ rather than ‘very valuable’ by both students and academic staff.

In summary, they note that both academic staff and students agree that information technologies improve learning. However academic staff agree more strongly than students that Information technologies can improve teaching. The authors suggest that student responses are possibly based on how the tools have actually been used. The perceptions / issues raised in this study of a non-commercial VLE by students and academic staff are no different to the types of issues raised in respect of commercial VLEs.

They raise the issue of academic staff development as a pre-requisite / requirement in order for academic staff to use VLEs in a constructivist approach. It could be argued in conclusion that the findings in this paper tie back to the Stiles and Yorke (2006) study and the importance of the institutional framework of policies and strategies in embedding change.

Reference

Morgan, G. 2003  Faculty use of course management systems. Educause Center for Applied Research.
6.0 References


Association of Public and Land-Grant Universities (2009) Online learning as a Strategic Asset, Volume II: The paradox of Faculty Voices: Views and Experiences with Online Learning. Washington DC, APLU


Bunce, D., Havanki, K. & VandenPlas, J. (2006) Comparison of the effectiveness of a student response system (SRS) vs. online WebCT quizzes on student achievement, Journal of Chemical Education. 3(83), 488-493


Feustle, J (2001) Extending the Reach of the Classroom with Web-Based Programs, Hispania, 84(4) 837-49


JISC (2007) In Their Own Words: Exploring the learner’s perspective on e-learning. London, JISC/HEFCE


Leung, Elvis Wai Chung and Li, Qing (2006). Distance learning in Hong Kong. International Journal of Distance Education Technologies, 4(3)1 –5


Lin, Q (2006) Student satisfactions in four mixed courses in elementary teacher education program, The Internet and Higher Education 11(1), 53–59


Mash, R J., Marais, D., Van Der Walt, S., Van Deventer, I., Steyn, M. & Labadarios, D. (2005) Assessment of the quality of interaction in distance learning programmes utilising the Internet (WebCT) or interactive television (ITV), Medical Education, 39(11), 1093-1100


McFarlin, B.K. (2008) Hybrid lecture-online format increases student grades in an undergraduate exercise physiology course at a large urban university, Advances in Physiology Education, 32, 86-91


Morgan, G. 2003 Faculty use of course management systems. Educause Center for Applied Research.


Patzold, H. (2005) Increasing value without increasing effort? The use of WebCT in accompanying face-to-face lectures under the constraint of low budget, Journal of Distance Education, 20(2), 78-84


The Impact of Blackboard Software on Education Globally Over the Past 10 years


7.0 Glossary of Terms

**Blended Learning**
Blending methods, techniques or resources and applying them in an interactively meaningful learning environment.

**Blogosphere**
Collection of connected communities, made up of all blogs and their interconnections.

**Cloud Computing**
Computing capability that provides an abstraction between the computing resource and its underlying technical architecture (e.g., servers, storage, networks), enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction.

**Developmental Education**
Field of practice and research within higher education with a theoretical Education foundation in developmental psychology and learning theory. Promotes the cognitive and affective growth of all postsecondary learners, at all levels of the learning continuum. Developmental education is sensitive and responsive to individual differences and special needs among learners.

**Distance Learning**
Field of education that focuses on the pedagogy and andragogy, technology, and instructional systems design that aim to deliver education to students who are not physically “on site.”

**CMS**
Course Management System

**HE**
Higher Education

**HEFCE**
Higher Education Funding Council for England
**JISC**
Joint Information Systems Committee

**LMS**
Learning Management System

**PLE**
Personal Learning Environment

**QA**
Quality Assurance

**Staff**
Academic Staff (the term ‘staff’ is used in the UK to mean all staff, but in the context of this research, it focuses on academic staff)

**TCO**
Total Cost of Ownership

**VLE**
Virtual Learning Environment
About us

What we do at Blackboard

We’re a company of more than 1,000 people who believe in the idea of improving education. We work with more than 5,000 institutions and millions of users to focus on a single mission: to increase the impact of education by transforming the experience of education.

Today that means engaging and assessing learners, making their daily lives more convenient and secure, and keeping them informed and aware. It also means giving more and more information to students on the mobile devices they prefer.

In short, wherever people are educating, in a K-12 school, a college campus, a workplace, a community, we’re working to make it better.

Find out more

Learn more about Blackboard and what we do at www.blackboard.com
The Impact of Blackboard Software on Education Globally Over the Past 10 years