Introduction

Blended learning has been operational for some fifteen years at the time of writing. Normally this would be long enough for optimal models to have evolved and regimes to be established to measure the effectiveness of the techniques employed. However, blended learning involves the use of technology – at least in part – and fifteen years is a long time in technology terms.

By way of example, fifteen years ago the Intel Pentium III processor was at the cutting edge of computer power with around 10 million on-board transistors. In 2014 the Intel Xeon Ivybridge EX processor has over 4.3 billion processors. In 1999 generally, the internet was accessed through dial-up modems at very low speeds, now fast broadband access is available to most people across Europe either through fixed or mobile provision.

These exponential increases in processor power and speed of transmission have not only changed the context to blended learning dramatically but changed the expectations of the consumers of learning. New devices, new techniques and new strategies have all combined to change what can be achieved.

Early online learning developed as an asynchronous process – especially outside the traditional University environment. As a student-centred teaching method it uses different resources to facilitate information sharing among a network of people (Mayadas, 1997). It is not constrained by time or place but was constrained by technology, particularly low bandwidth, that restricted the complexity of course material and effectively prevented the construction of synchronous interaction.

More recently, with the effective removal of bandwidth constraints, synchronous online learning has been developed as a way of addressing the issues of transactional distance experienced with asynchronous learning. According to Moore (1991) transactional distance is

“a psychological and communications gap, a space of potential misunderstanding between the inputs of instructor and those of the learner”

Although Moore’s thinking was prompted by old-style distance learning it is clear that it applies equally well to asynchronous learning methods online. This is created in part by the physical distance inherent to online learning. A large transactional distance may contribute to students’ feelings of isolation and disconnectedness, which can lead to reduced levels of motivation and engagement.

An example of a synchronous learning environment would be having students and instructors participate in a class via a web conference tool that facilitates interaction between students and between students and instructors. Synchronous experiences are designed to develop and strengthen instructor-student and student-student relationships to ensure students remain motivated and connected.

Blended learning incorporates both asynchronous and synchronous online methods together with conventional group-based teaching. The first part of this paper explores different blended learning models and provides a framework for analysis.

The second part of the paper will examine the components of a typical blended learning system including tools for:

- content management;
- Course/ module management;
- Delivery and moderation
The third part of the paper takes that framework and constructs a questionnaire about the incidence and nature of blended learning in real estate education specifically. The cohort under investigation comprises of real estate departments within universities around Europe. The methodologies used will be online survey triangulated with some in depth interviews and case studies of particular implementations.
Blended Learning definition

Although the term “Blended learning” has been around for some time, it is prone to differences in interpretation and delivery. In higher education, the term “hybrid course” was often used prior to the emergence of the term “blended learning,” and now the two terms are used interchangeably. The debate regarding the precise meaning and relevance of the term is set out in, for example, Driscoll (2002); Graham, Allen, & Ure (2003); Laster (2004); Masie (2005); Oliver & Trigwell (2005); and Osguthorpe & Graham (2003).

It should be noted that all these papers are ten or so years old - a lifetime in technology terms. This is particularly relevant given the growth of, potentially disruptive, Massive Open Online Courses (MOOCs) over the past decade.

The most commonly held definition is that blended learning environments combine face-to-face instruction with technology-mediated instruction (Graham (2005)). Even this simple definition hides a high degree of variation as to:

- The balance between computer mediation and traditional teaching
- The extent of the scope for autonomous student action; and
- The complexity of the computer mediation (Whether or not it is just a straight replacement for conventional teaching or whether it is used to deliver different techniques = simulation for example.)

Picciano (2007) postulates that blended learning is not one thing but can come in different flavors, styles, and applications and may mean different things to different people. This research, based upon a Sloan Foundation workshop in 2005 found that, in the broadest sense, blended learning may be defined as a spectrum of technology integrated with a sliding scale of conventional, face-to-face classroom activities.

![Blended Learning Diagram](image)

Figure 1 Broad conceptualisation of blended learning after Picciano (2007). Mainstream blended learning sits around the centre of the chart where the four quadrants meet.

In a second Sloan-funded workshop in 2006 blended learning was defined as:

1. Courses that integrate online with traditional face-to-face class activities in a planned, pedagogically valuable manner; and
2. Where a portion (institutionally defined) of face-to-face time is replaced by online activity
Advantages & Disadvantages

Blended learning enables students to become more engaged with the learning process and research has found that it improves commitment and perseverance (Donnelly, 2010; Sharpe et al., 2006; Wang et al., 2009; Wolter et al., 2009; Yen and Lee, 2011). Combining Asynchronous and Synchronous teaching methods allow a student-centred approach to learning but one in which transactional distance is kept to a minimum.

For the student, blended learning allows control of the learning process to be exercised within a structured framework of synchronous lectures and interaction with faculty. Course material is available at any time for re-reading or revision and can be structured into many different layers to facilitate appropriate levels of analysis.

For the faculty, content can be maintained and kept current easily. Student progress can be monitored in real time and interventions made on the basis of individual exception.

The disadvantages relate to the technology itself. Significant investment may be required in equipment, software and, particularly, bandwidth as a precursor to the implementation of a blended learning system. Faculty often need significant training in the creation, structuring and management of content as well as the management of the learning process itself. Finally, the assumption is made that students themselves are familiar enough with the technology to take advantage of blended learning.

A survey by Allen and Seaman (2013) of over 2,800 US universities and colleges found that 32% of students—over 6.7 million total—are taking at least one online course. While the annual growth rate of online enrollment has slowed from an extremely rapid 30%+ rate of ten years ago, it is still increasing at a rate of over 9% every year. This growth rate is not surprising since almost 70% of higher education academic leaders believe that online education is crucial for their long-term strategy. Although historically many institutions met online education with resistance, over the past 10 years, the percentage of academic leaders that rate the quality of online classes equivalent or higher than face-to-face classes has steadily increased from about 52% to 77%.

As to the effectiveness of blended learning, the literature is mixed. The majority of studies find that there is no difference in student learning outcomes between modes of instruction. For example, Ashby et al. (2011), found no statistical differences in student grades in a mathematics course when taught face-to-face compared to online or blended teaching methods. However, using a sample of over 140,000 students on over 6,000 courses, Cavanaugh & Jaquemin (2015) found that students studying online outperform students learning conventionally.
Blended learning models

Further research by Picciano (2009) proposed a multimodal model he called “blending with purpose” for the development of blended learning programmes. This research suggests that instruction be designed to meet the needs of different types of learners - specifically, students of different generations, different personality types, and different learning styles. A major benefit of this multimodal model is held to be that it allows students to experience learning in ways in which they feel most comfortable.

Figure 2 The blending with purpose multimodal model after Picciano (2009)

Figure 2 shows a schematic of Picciano’s multimodal model. This presents six basic pedagogical activities and potential approaches to meet them. The model can be implemented as a whole or in parts with lecturers and course designers understanding how to apply the technologies and approaches that will work best for their students. Other activities can be added as appropriate. The basic modules identified are:

- **Content** - Content is one of the primary drivers of instruction and has become the main beneficiary of rapidly increasing technological capability. It is now routine to deliver streamed video content, for example, in ways that would have been unthinkable fifteen years ago. Similar advances are able to deliver real time simulation and gaming where appropriate. Typically, successful blended systems are implemented with a quantum leap in the quality of teaching materials;

- **Social/ Emotional support** – Supporting students socially and emotionally is an important part of the educative process. Students frequently need someone with whom to speak, whether to better understand a concept or to gain access to advice. Fully online courses often struggle in this area and this might best be provided in a face-to-face mode.

- **Dialectics** - Questioning is an important activity that interrogates what students know and helps to refine their knowledge. The main tool in use is a threaded electronic discussion board that has the benefit of recording the interaction between faculty, student and other students. This electronic record can be reviewed to examine how students have participated and progressed over time.
• **Reflection** - Pedagogical activities that require students to reflect on their learning and share their reflections can provide useful feedback on the personal learning process. Writing a blog is evolving as the tool of choice in this area;

• **Collaboration** - Collaborative learning in groups is a long-established technique particularly for problem solving. This is an area where the corporate world has driven up the quality of collaborative software such as Glasnost but in the academic sphere the wiki has become the tool of choice for capturing and sharing project information. Wikis allow students to generate content that can be shared with other classes and years.

• **Synthesis/Evaluation** – Probably the most important component of the model is the synthesis and evaluation of learning – and the area where fully online courses struggle most. Increasingly, tests, papers and assignments are being created, distributed, marked and returned electronically. Traditional classroom activity is being recorded and made available for distribution on, for example, YouTube or as a podcast.

Clearly, the pedagogical objectives of any course should drive the activities that take place and it follows that not all courses will include all these activities. A key weakness with this approach may not lie with the model itself but in the assumption that faculty in general have the technological appreciation and knowledge to use the tools described to meet the pedagogical objectives.

More recently MIT (2012) set out their own interpretation that defines blended learning as structured opportunities to learn, which use more than one learning or training method, inside or outside the classroom. This definition includes potential variation in learning methods, delivery methods, scheduling and levels of guidance.

![Blended learning (MIT definition)](image)

*Figure 3 MIT’s blended learning model*

While the MIT model encompasses the main operational variables it, like Picciano, assumes a high level of technological awareness that may not be present in the faculty.

It is clear from the literature that coherent conceptual models have been developed to describe blended learning.
**Blended learning tools**

Key to the introduction of blended learning are software that addresses two areas:

- content management;
- Learning management – incorporating delivery and moderation

**Content management**

Content management systems (CMS) are used in the creation and management of learning material. Typically they facilitate the structuring of material into modules and the combination of different types of content ie text, graphics, video and audio. The key advantages are that:

- they reduce the level of expertise required to assemble online learning material; and
- they facilitate regular updating of material.

These are important advantages in an environment in which expertise is often focused on the quality of the content rather than the technical delivery and in which resources are constrained.

Browning and Lowndes (2001) identify the potential overlap between CMS and other document management systems, knowledge systems and virtual learning environments.

Research undertaken by Armstrong et al. (2001) provides a starting point from which changes within content management in UK Higher Education Institutions can be identified. He investigates the growing importance and scale of the web, the convergence of library and computing systems; and the widespread adoption of CMS in Higher Education in the UK.

Slightly newer research by Cox (2007) extends Armstrong et al.’s research through insights drawn from 15 semi-structured interviews of individuals in the UK university sector conducted in 2004. These qualitative insights are explored further in a survey of website content management across Higher Education in the UK by Cox and Emmott (2007).

**Learning Management Systems**

According to Szabo & Flesher (2002) a Learning Management System (LMS) is the infrastructure that delivers and manages instructional content, identifies and assesses individual and organizational learning or training goals, tracks the progress towards meeting those goals, and collects and presents data for supervising the learning process of the organization as a whole. It is independent of any content.

The focus of an LMS is to deliver courses to students, while managing their activity and keeping track of their progress and performance. At a subject level the most important features relate to Course Management, supporting the placement of course materials online, associating students with courses, tracking student performance, storing student submissions, and mediating communication between the students as well as the faculty.

**Virtual Learning Environments**

Virtual Learning Environments (VLE) may incorporate some or all the features of both LMS and CMS. A VLE models conventional face-to-face education by providing equivalent virtual access to classes, content, tests, assignments, grades and other external resources. It is also a social space where students and teacher can interact through threaded discussions or messaging.

VLEs are the core software components of any blended learning system. The VLE facilitates synchronously or asynchronous learning. Synchronously, participants meet in real time and teachers conduct live classes in virtual classrooms. Lessons are presented using audio, video and/or presentations. Students are able to talk with each other and the lecturer, as well as collaborate, and answer or ask questions. The VLE has tools that enable students to raise their hand virtually, send messages, or answer questions posed by the lecturer.
Asynchronously, students complete lessons and assignments independently using the VLE at their own pace and tools are available for self-assessment.

In the US higher education market, research by Campus Computing (2013) shows Blackboard is the leading provider with 41% market share, with Moodle (23%), Desire2Learn (11%) and Instructure (8%) being the next three largest providers. In Europe Moodle tends to be the market leader overall but in specific countries homes grown alternatives lead:

- Ilias – Germany
- Claroline – Belgium
- GUnet – Greece
- Articulate – Norway
- OLAT - Switzerland

Typically these have been produced by specific universities and then propagated across other faculties.

**Blended learning adoption**

Research for the European University Association (Gaebel et al, 2014) shows that – with very few exceptions – practically all higher education institutions surveyed have started to embrace e-learning. Most of the surveyed institutions use blended learning (91%) techniques, integrating e-learning into conventional teaching, but surprisingly, 82% of institutions also indicate that they offer online learning courses.

Less frequent, but, seemingly also on the rise, are other forms of provision such as institutional collaboration and online degree courses. Online examinations are likely to become more widely used for all students in all or most disciplines, also for conventionally taught courses. Besides pedagogical and economic motives, the institutions refer to a growing need for flexibility of time and place, and better use of resources, benefiting both residential students and a wider range of professional and other lifelong learners.

While practically all institutions are involved in e-learning in its various forms, the level of mainstream application varies considerably: only half of the institutions surveyed indicate that e-learning is implemented throughout the institution and less than one third of institutions involve all or most of their students in e-learning.

Particularly frequent use of e-learning is reported in such disciplines as business and management, education and teacher training, engineering and technology subjects; however, it is rarely applied in law and arts. Thus, only around 20% of institutions indicate using it in all disciplines.

E-learning activities are often driven by individual departments or even individual academics and faculty-wide e-learning strategies are not very frequent (13.8%), but nearly half of the surveyed institutions have an institution-wide strategy in place, and 25% have strategies under development.

Over 80% of the respondent institutions indicate that they use digital courseware, online repositories for educational material, tools and management systems for content development and course management and student portals.

Nearly all institutions provide students with email accounts, access to Wi-Fi, computer rooms and online libraries. Around 80% of the surveyed institutions provide campus licenses for software, repositories for course and study materials and online course catalogues, and rely on social media to communicate. Almost 65% of institutions report the use of online examinations for all or some students, with a further 9% planning to introduce them. The vast majority of institutions indicate that they provide specific student support for e-learning and staff training; one third provide incentives to staff.
Blended Learning in Real Estate

In order to understand better how real estate education interacts with blended learning tools and strategies a survey of full and part-time academics in the field was undertaken in early 2015. The online, English-language survey was distributed to over 400 real estate academics across Europe and received 120 responses.

Response

Unsurprisingly, 95% of the respondents were affiliated to an University; 39% were at Academic Director level and 26% were module co-ordinators responsible for a dedicated area of real estate education.

As far as undergraduate delivery is concerned, 67% provided full time courses and 33% part time courses with under 1% covering distance learning options. Distance learning rises to 8% of postgraduate education in the sample with 69% providing full time courses and 45% part time.

In terms of student numbers, 48% had over 100 students enrolled, 32% between 30 and 100 and 20% under 30. This is held to be a stable cohort that is representative of the real estate education universe.

Practice

Learning methods determine the nature of the optimum tools to be used in their execution. Respondents were invited to estimate the distribution of their courses between different learning methods – for example Lecture, Reading etc.

![Learning methods chart](chart.png)

Lecturing was, as expected, the most dominant learning method amongst this cohort at 37% however a significant number of courses are adopting more active pedagogies such as guided practice, simulation and gaming.

Splitting these learning methods by type of course revealed no significant differences in method between full and part time delivery. Distance learning sees fewer lectures (29%) and more reading (25%) again, in line with expectations.

Changes in pedagogical practice, student expectations, technology and demographics have resulted in the development of different modes of learning or modification to more traditional approaches to include a more dynamic interaction between academic staff and students. Barr and Tagg (1995) describe the shift between
transferring knowledge from faculty to students – the instruction paradigm – and student discovery and construction of knowledge – the learning paradigm.

This survey shows that traditional, lecturer-led learning accounts for just over half of real estate education with student-led and group learning paradigms taking 23% each.

An ongoing debate in the literature addresses the usefulness of asynchronous versus synchronous learning. Asynchronous learning makes it possible for learners to learn at their own pace and in their own time, albeit within the constraints of the course timetable. Many people take courses because of their asynchronous nature, combining education with work, family, and other commitments.

Synchronous, group learning takes advantage of the group dynamic offered by a class of learners. Both methods of scheduling learning are applicable to online and offline learning. Respondents were invited to break down their scheduling by method.
Here the survey uncovered some differences between postgraduate and undergraduate learning. For postgraduates 71% of learning is in the classroom while for undergraduates synchronous scheduling stands at 63%. Interestingly, little difference is apparent if split by delivery type. Full time, part time and Distance learning all see around 60% synchronous scheduling. This seems counter intuitive for distance learning but demonstrates that group learning can be virtual as well as location based.

**Demand**

Research by Global Industry Analysts Inc in 2014 projected that the global eLearning Market was expected to reach $107 billion by 2015 driven by significant growth in India, China and eastern Europe. Although much of this growth is in the corporate learning sector, the widespread availability of online learning has the potential to change the market’s perception of what universities should be providing, particularly in the postgraduate area. Deming et al (2015) report that 2012 saw 23 large for-profit online campuses award nearly 75,000 bachelor’s degrees in the United States, more than 5% of the total.

Continuing budgetary constraints place pressure on University management to reduce the operational costs of providing courses. Online courses are a potentially important source of cost savings in higher education, with the primary channel being reduced labour costs through larger class size and less face-to-face interaction (Bowen 2012).

Faculty attitudes toward online learning remain problematic with numerous studies indicating a majority of college professors continue to hold negative opinions (e.g. Allen & Seaman, 2010; Jaschik & Lederman, 2014).

Student attitudes to e-learning have been surveyed in numerous disciplines outside real estate and found to be broadly positive for example Kramer, Brewer & O’Brien (2008) or Brumini et al (2014).

For the most part this survey confirms previous research in that demand is perceived to be growing from University management and from the market but not from the faculty itself. Interestingly the Students are perceived to be neutral on the issue.

This question attracted a range of comments from respondents making two key points: Firstly that e-learning is seen as complementary to mainstream (ie conventional) teaching; and secondly that students are
demanding more face to face time rather than less. The point was also made that in some cases management
decisions in this area are overly influenced by cost factors rather than by outcomes.

Suggestions were invited as to which subjects might suit a blended approach. By far the largest response here
was that ALL real estate subjects are suitable for blended learning. Specific subjects included market analysis,
investment appraisal, valuation and development. A small number of naysayers professed that NO real estate
subjects were suitable and a slightly larger number suggested that blended learning was only suitable for the
basics.
Virtual Learning Environment (VLE)

Moodle and Blackboard, the two largest global platforms, take the lion’s share (67%) of institutions in this survey. This an indication of the maturity of the software in that implementations have begun to coalesce around market leading products as increased complexity increases the risk of failure for internal software development.

It is instructive that nearly 20% of respondents don’t know whether their institution has a VLE or if they do, what it is.

45% of respondents have been using the VLE for over 5 years but again nearly 30% of respondents have never used it. Of those, half do not plan to use a VLE in the future!

The views of VLE users are very positive in this survey. Productivity is the least positive issue, although still 45% positive against 25% negative views. The point was made that productivity gains are hard to make because of the almost experimental nature of the VLE.
70% of respondents to this question felt that using the VLE alongside conventional teaching enhanced the achievement of learning outcomes and 66% felt that the students were satisfied with the mix. 55% felt that the VLE was both easy to use and easy to manage although the point was made that, as the delivery technology has become crucial, the importance of performance and connections has become equally important.

How the VLE was being used was not part of the survey. Comments were made that there were problems with participation and that it was mainly used as a repository for course material rather than an aid to teaching. One cynical observation was that its main function is to lower the bill for photocopying!

When it comes to skills, the responses are far less positive. As far as generation and management of content are concerned 54% and 68% respectively feel competent but only 23% feel that they have been properly trained in the use of the VLE. The comment was made that it takes a long time to create good quality content.
50% felt that students have the requisite skills to make use of a VLE but the comment was made by several respondents that many students are not motivated to use the system and therefore fail to gain much benefit from it.

**Webinar**

By comparison with the VLE, conferencing software, very common in commercial companies, has a relatively small following in this survey.

![Conferencing software chart]

By far the largest response was “Don’t know” indicating that this is not a mainstream application for the responding institutions. In fact 69% have never used conferencing software for real estate education and half of those do not plan to use it in the future.

This goes to the heart of Face-to-Face teaching versus online learning. The point is made by several respondents that they believe full time education particularly should be Face-to-Face and that there are institutional rules concerning attendance and keeping term that delivery of lectures online could undermine.

The active users of web conferencing to deliver lectures are broadly positive in their comments although connectivity issues were raised by several respondents.

**Conclusions**

The survey of real estate education providers has thrown up some interesting points and raised some equally interesting questions. Blended learning implies a mix between conventional teaching and online learning and one of the objectives of this research is to assess the balance between those two poles seen in real estate education.

Successful blended learning is achieved not only through having the appropriate technical infrastructure but also through having the right culture, ie one that is focused upon outcomes rather than the status quo and is open to change. Christensen & Overdorp (2000) point out that, to be effective, change often needs to be disruptive. Online learning has the potential to disrupt conventional university teaching but, as far as real estate education is concerned there is little disruptive impact on show here.
Insofar as blended learning is a way of managing that disruption it may be that the adoption of blended learning in real estate course has proved successful. However, although some components of a blended solution are apparent, there is yet little evidence of either engagement with, or implementation of, real change.

Typically, the infrastructure for a blended solution would comprise, in addition to conventional classrooms:

- a learning management system (the VLE) that facilitates access to material and communication with students; and
- conferencing software that enables online delivery of material using multiple channels, typically audio, video and textual material.

Although the majority of institutions represented here have adopted a VLE, most have not approached the idea of online delivery and a vociferous minority oppose it in principle. It is also clear that many institutions are not using the full capabilities of the VLE. This begs the question whether the current culture in real estate education is appropriate for blended learning to become successful.

As far as faculty are concerned, all points on the spectrum are represented here from the enthusiast through to the naysayer. It is clear from the survey that training is an ongoing issue both in respect of content creation and the VLE but changing culture goes way beyond just training. Terosky and Heasley (2015) argue that a stronger focus on developing a sense of community and collegiality in faculty development efforts would help engage faculty more deeply in online instruction.

One issue not directly addressed by the survey is the relationship between institutional strategy, for example to implement a blended learning environment and the role of individual faculty members. The comments reveal that in many cases faculty have free rein concerning the quality of content provided, the means of provision and engagement with the VLE. In the commercial environment content is the preserve of specialists, particularly where audio and video channels are being used. This begs the question as to whether faculty should acquire specialist skills in online content presentation particularly.

Technological problems manifest themselves as concerns in this survey and it is clear that communications infrastructure in particular has an important role to play in the delivery of content. The nature of the interfaces involved, their performance under load and the ease with which issues can be resolved are all important factors.

There is a view, strongly expressed in the survey, that, in the opinion of the respondents, students would be opposed to any attempt to replace face to face teaching with online provision. A majority felt that students were happy with the current mix. No research has yet been undertaken amongst real estate students in this area but, in other disciplines, students have rated their online instruction as moderately satisfactory, with hybrid or partially online courses rated as somewhat more satisfactory than fully online courses (for example Cole, Shelley & Swartz (2014)). This begs the question as to how satisfied real estate students are with the current regime and how satisfied they might be with a higher component of online learning.

This paper encapsulates the research undertaken so far. In the coming months Faculty members, managers students and service providers will be interviewed to seek answers to some of these questions. Thus far the implications that can be drawn from the research are limited but it seems that the potential for blended learning to enhance educational outcomes, faculty productivity and institutional reputation are some way in the future.
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