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Re-Engineering Assessment and Technology Enhanced Learning: A Blended Approach to Teaching Undergraduate Modules

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Abstract: The introduction of learning technology is altering the way in which students learn (and tutors teach). With the increasing use of Virtual Learning Environments (VLEs) a more student-centred approach is being encouraged and this in turn leads to a change in the learning and teaching culture from the passive classroom student to one of the active 'independent elearner'. The area of learning, teaching and assessment in education and industry has historically been facilitated by traditional classroom teaching by a teacher in a face-to-face setting. As such, not all institutions, organisations and students are prepared for this change. This paper discusses a blended learning approach, developed by the authors, to teaching undergraduate modules that encourage students to undertake independent learning in a practical and non-threatening manner. This approach is based on the utilisation of aspects of traditional teaching, VLEs and Web 2.0 technologies. The model discussed in this paper is the culmination of a project funded by the Re-Engineering Assessment Project (REAP) and initially involved a questionnaire survey of a group students who were undertaking the traditional module from which a proposal for the 'blended learning' model was posited.

1. Introduction

Traditionally the lecture theatre, seminar room and laboratory, the basis of conventional teaching and learning spaces, have been derived from long-standing teaching and learning models. However, these models are changing. A wider, more diverse student population has created the need for greater flexibility in curriculum design and course delivery, accompanied by innovations in teaching and learning. A more flexible style of teaching and greater independent learning by students is now required to cope with these changes. However, the question is how can independent learning be encouraged, will it be through technology enhanced learning or by one of the older but tried and tested methods such as self-study, videos, computer-based training (CBT), role-plays, groupwork or by teleconferencing or web-based seminars? With all these options to choose from, it can be confusing for many university lecturers and students familiar with the more traditional educational forms. Furthermore, many studies claim that this technology has many advantages over traditional education [8]. However, despite this the use of these technologies by institutions has been at best varied with many tutors and students still coming to terms with Virtual Learning Environments (VLEs) such as Blackboard. Basically the cultural shift to Technology Enhanced Learning has been proving difficult with many lecturing staff and students unwilling to embrace the new approaches [2].

Moreover without proper instruction in the new learning media students are having difficulty becoming 'independent learners' [9]. Fundamentally, most experts agree that more research, experimentation and better tools are needed to approach the maximum potential that this new technology offers, [11] and [8]. How then can all of these techniques become more useful to university staff and students? The answer would appear to be to encourage independent learning by facilitating a 'blended learning' approach. This paper discusses the growing popularity of blended learning and offers a prototype, developed by the authors, utilising this approach to teaching and learning.

2. Objectives

The main objective of the project was to develop a new 'blended learning' model to encourage independent learning. The research was funded by the Re-Engineering Assessment Practices (REAP) project, which was set up by the Scottish Funding Council to encourage changes in teaching and learning through technology. The authors are lecturers of long standing who have worked for several years in the area of developing and using Technology Enhanced Learning. They applied for funding through their institution, Glasgow Caledonian University. Their idea was to consider the adoption of a blended learning approach in order to enhance traditional teaching practices i.e. develop an approach to teaching an undergraduate module using existing some aspects of traditional teaching, Technology Enhanced Learning technology (Blackboard) coupled with Web 2.0 technology. To this end a review of the literature and a student survey were undertaken and a proposal developed [10]. The initial research and idea for a prototype was undertaken in 2006/2007 and the prototype proposed in this paper was developed, based on that research, in the summer of 2007. The next objective is that the findings for this research should hopefully benefit a number of stakeholders including students, staff and also business organisations that employ training schemes as the methods and techniques applied should have a universal benefit. Another objective for any research is to define the terms used in that research. As such it is important to derive a working definition of the main terms in this research, namely 'independent learning' and 'blended learning'. The 'blended learning' model should ultimately alleviate the time, space and geographical location problem of accommodating large numbers of students.

2.1 The Importance of Independent Learning and Blended Learning

The term 'independent learning' is not new, but it does encourage debate on an exact definition of what it is. Discussions on independent learning are awash with synonyms to describe this term. Kesten [12] lists them as, 'autonomous learning, independent study, self-directed learning, student initiated learning, teaching for thinking, learning to learn, self instruction and life-long learning'. Moreover, this proliferation of terms is made worse by the fact that many authors use the same term to mean different things. As Broad [3] says, 'confusion exists due to the number of terms and possible interpretation of those terms'. Furthermore, recent reports highlight the fact that undergraduates, 'struggle to cope with the independent and self directed style of learning expected by higher education tutors' [17]. Given this it can then come as no surprise to discover that students are uncomfortable with independent learning. However the hope of the authors of this paper is that the technology involved in their model will encourage the students to become independent learners. In order that independent learning is successful it will be important that staff and students are competent in VLEs and other learning technologies. Coupled with this they will need new skills in facilitating the relevant instructional methods. There are many views on what blended learning is. However, like so many terms within this field it remains ill defined. For example, Whitelock & Jeffs [16] offer three definitions, 'the integrated combination of traditional learning with web-based online approaches; the combination of media and tools

employed in an e-learning environment and the combination of a number of pedagogic approaches, irrespective of learning technology use.' Also, in his support for this approach Masie, cited in Rossett [14] states that, 'We are, as a species, blended learners'. Julian and Boone [12] agree when they argue that, 'The importance of a blended approach to learning is that it ensures the widest possible impact of a learning experience…' The authors of this paper tend to support Valiathan's view of blended learning when he states that, 'Blended learning is also used to describe learning that mixes various event based activities, including face-to-face classrooms, live elearning and self-paced learning'. This view of blended learning is enhanced by three models, skills driven, attitude-driven and competency-driven. However, the problem is that the breadth of interpretations means that almost anything can be seen as blended learning, and consequently this is confusing for academic staff, students and business practitioners. The next section will consider how the utilisation of Web 2.0 technologies for blended learning can encourage independent learning.

2.2 Blended Learning and Web 2.0 Technology

There are a number of areas in Higher Education where, it is argued, that blended learning can help and these include, increasing student numbers, automated assessment, widening participation and improved access to limited resources. However, the most important driver suggested for choosing a blended learning approach is that it will give enhanced benefits to traditional face-to-face teaching and learning and facilitate independent learning. As online tools become more ubiquitous inside and outside the classroom, and the growth of distance learning continues, educational researchers have begun to focus on how best to harness new technologies. As such there are many technologies being researched that can be used to facilitate and stimulate online education including what is referred to as Web 2.0 [5]. This term encompasses a variety of different meanings that include emphasis on user generated content, data and content sharing and collaborative effort together with the use of various kinds of social software such as Second Life, Blogging, WiKis, social book marking, pod casting, vidcasting and (in our case, Compendium software). However technology must not be the driver of blended learning. Technology should never be used simply to substitute face-to-face learning, but must clearly offer an improved educational benefit. Also, coupled with Web 2.0 technology students must involve communication and socialisation and it is here where 'social networking' activity if applied correctly could prove beneficial. The loss of face-to-face presence is, understandably, one of the most contested issues in online learning. Hara and Kling [7] note that, 'Human communication is inherently ambiguous but that these ambiguities are generally resolved adequately in face-to-face contexts'. Garrison et al [6] agree but comment further when they state, 'In face to face interaction communication can be entrusted to habit or instinct…communicators in a virtual environment have to 'think' about their metacommunication'. Therefore a social environment online is necessary. As such, this situation could be improved through the use of social networking tools such as WiKis and web logs. On reviewing the available technologies associated with web 2.0 the authors were impressed by the possibilities for their own model. The next section will discuss the activities that led to the development of the blended learning prototype.

3. Methodology

3.1 The Re-engineering Assessment Practice (REAP) Project

As stated earlier this paper discusses the development of a prototype model funded by the REAP project within Glasgow Caledonian University. The authors' proposal was to convert the existing third year undergraduate module from a traditional face-to-face format into a

format based on Technology Enhanced Learning/blended technologies. The existing module format comprises of 12 lectures, 12 seminars, a clinic and a lab and is of 12 weeks duration.

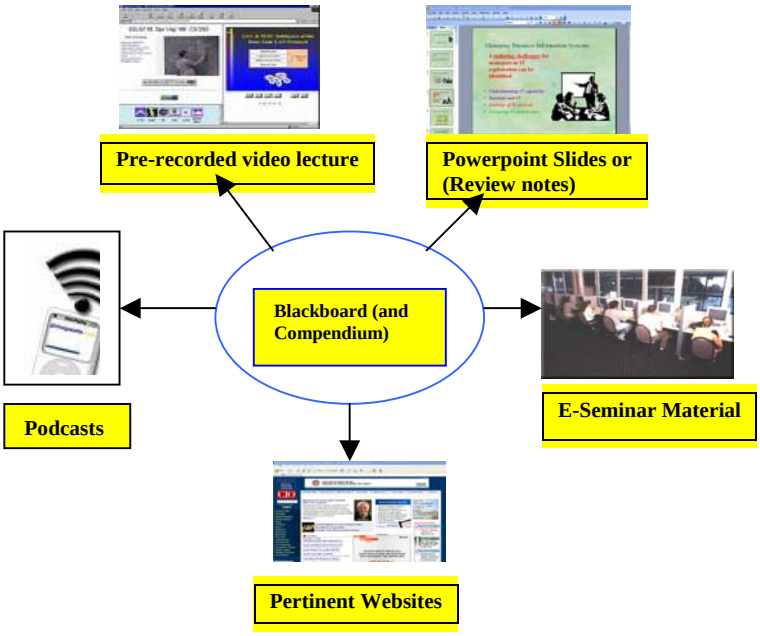

Figure 1: Package for Independent Learning and Teaching (PILAT)

The current assessment is in two parts, group coursework (50%) and a final examination (50%). In general it is envisaged that the changes would encourage independent learning by the students and instigate some degree of online assessment. The model has incorporated 'blended learning' features including face-to-face, Blackboard, Compendium software and social networking technology. The methodology adopted for the original project included a literature search and a survey. This in turn produced a proposal for the development of a blended learning prototype. The methodology for this paper was essentially based on this proposal. The proposal was to convert traditional lectures and seminars to an online format using a combination of the Blackboard VLE, the Open University's 'Compendium' software, Web 2.0 technologies and some element of face-to-face communication. This has now been completed with the production of the prototype, which will be highlighted in this paper. A student survey was previously undertaken where the questionnaire comprised a series of yes/no questions and one opinion based question. Overall the responses were in favour of a 'blended' approach and this led to the proposal (See Figure 1) and a framework on the way forward for the project. The prototype discussed in the paper was based on that proposal.

4. Technology and Developments

When developing the blended learning prototype it was considered from two perspectives; pedagogy and technology. From a pedagogical perspective independent learning and blended learning aspects were incorporated and from a technological perspective how best to encourage the students to access the model were considered. As such a variety of technology platforms were used to build the prototype, however the main vehicles were Compendium software for content management and Blackboard for the group communication element and formative assessment.

Figure 2: eMBIS Lecture on Blackboard

Other Web 2.0 technologies such as Blogging and pod casting are also incorporated in the prototype. Based on the authors' original ideas and enhanced by the student responses to the questionnaire [10] the prototype incorporates many features both in Blackboard (See Figure 2) and by the innovative use of the Compendium software (See Figures 3 – 7 for examples of the content developed). Compendium's advantage is that it allows for the incorporation of all manner of content such as the video lectures, podcasts, Powerpoint slides, seminar material etc., (See figure 6), that the students can access online on a weekly basis (i.e. each teaching week) thus cutting classroom time (and room allocation) and encouraging independent learning. However, access to the tutor will always be available at the weekly clinic to deal with any issues that may arise. The video presentations were recorded with Movie Maker Pro and are of 5-10 minutes duration; podcasts were recorded with Audacity (links to practitioner podcasts are also attached); links to relevant subject websites were included as were PowerPoint slides and seminar material for the lecture topic. E-Seminars are facilitated in Blackboard's Virtual Classroom and students' participation will be monitored (contribution rates can be logged in BlackBoard) and this will form part of the module assessment.

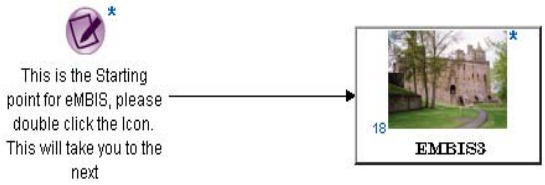

Figure 3: Initial Screen Option for eMBIS in Compendium

The weekly face-to-face Clinic will be timetabled for all students for advice and assistance with any aspect of the module and would be held to maintain a personal link with the students.

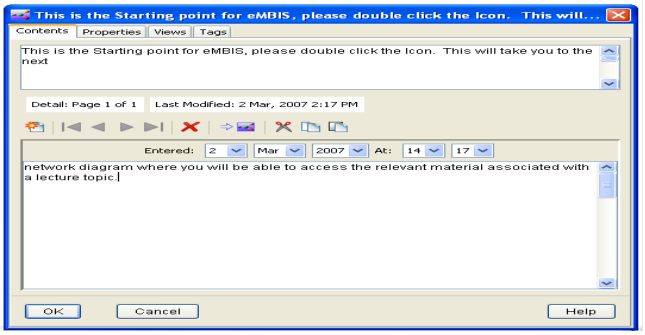

Figure 4: Set up screen for text instructions

Assessment instruments are also catered for in the prototype (See figure 7). Formative assessment using BlackBoard Multiple Choice Questions (MCQ) can be facilitated.

Blogging software is to be used for keeping a diary of issues and developments and web-based presentations will be assessed. The final examination will be held in a traditional format, thus adding to the blended learning ethos. The blended learning prototype is a work in progress and further work will be required. As such the final results will not be known until the prototype goes live at start of the new semester in October 2008 (see Section 5). It does however currently demonstrate how the teaching module will function in this blended learning mode.

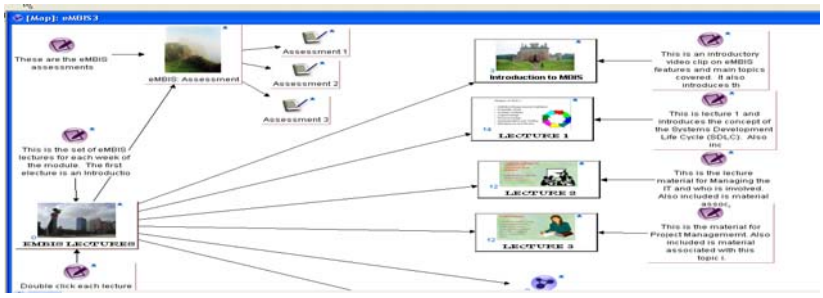

Figure 5: First Screen showing all Lectures and Assessments

The lessons learnt from this research project thus far are that developing such a prototype is very time consuming (the authors worked on the project while still maintaining a full teaching commitment) and although constrained by time and minimal funding the authors have managed to produce a working prototype.

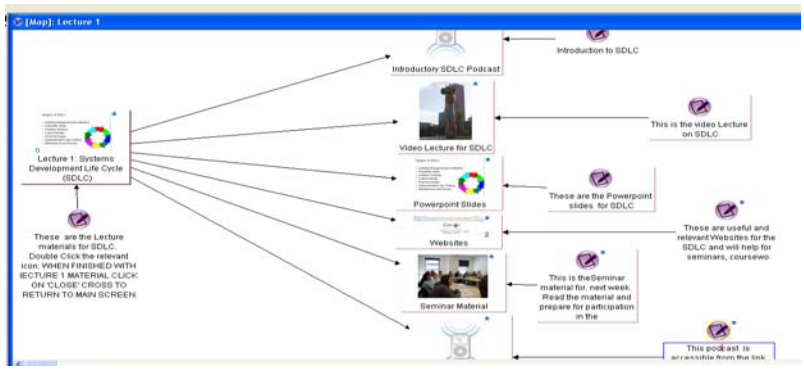

Figure 6: Content of an eMBIS lecture

Essentially the next phase of the project will be to fully convert and set up the full 'content' of the eMBIS module (even completing the prototype was very time consuming) before going live.

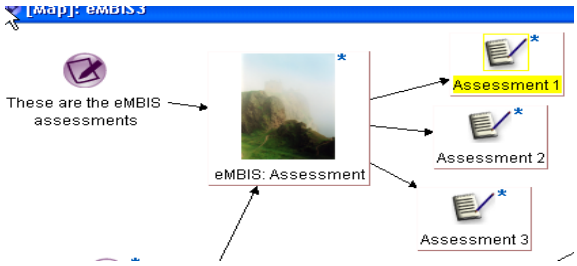

Figure 7: Clicking on the icons will access the assessment task

5. Business Benefits

According to Michael Clouser of eCornell business take up for Technology Enhanced Learning for Continual Professional Development (CPD) is increasing by 25% a year. Coupled with this many business organisations have also adopted blended learning and recognise this as an important component of their overall strategy. For example BUPA have hired Brightwave to train their 2,500 employees. Claire Shell [17], elearning manger

at BUPA states that, 'Working with Brightwave... has shaped our use of elearning and blended learning'. County Durham Primary Care Trust [4] have also utilised blended learning to, 'provide a training programme that combines face–to-face and elearning'. Furthermore, blended learning programmes are increasing within business organisations. According to research by Balance Learning and Training Magazine [1],'blended learning is now used by 55% of organisations' and in a further study '81% of organisations surveyed believe blended learning is an effective means of learning'. Given that many business organisations are already familiar with the concept of blended learning, the prototype developed by the authors will not only encourage independent learning amongst university students, but will also provide such business organisations with an easy to use and adaptable approach to teaching and learning. It is expected that the blended learning model will go live in October 2008, when a group of third year undergraduates will be asked to participate. It is envisaged that they will be issued with either a CD or USB flash drive containing the content for the model. These students will then be able to offer their views on the model via questionnaires and interview sessions and the results will be compared with responses from a group of students who did not use the new model. Given that we receive a positive response from the students then the idea initially would be to offer it to other courses and departments via training sessions. The model will hopefully alleviate the issues of increasing student numbers, encourage automated assessment, allow for widening participation and improved access to limited resources.

6. Conclusion

In the literature, in business and in educational institutions it has been recognised that blended learning is being driven by technology and this in turn should encourage independent learning. However, there is some confusion over which technology may be the most suitable to encourage such independent learning. Furthermore some businesses, tutors and students are wary of the change in traditional teaching approaches and as such do not wholly embrace the idea of elearning for all aspects of teaching. However given that blended learning incorporates elements of traditional teaching with those of elearning technology this approach could be the solution to those concerns. To this end the authors have developed a 'blended learning prototype'. Although the model is currently just that, a prototype, the next phase of the project is to test the product with a group of students and evaluate its effectiveness. Depending on the results of this research the blended learning model structure could then be exploited for any module on any course and also be used/adapted in the business environment for training courses. Given our experiences with this project the authors suggest that utilising Web 2.0 technology and Blackboard facilities, with some aspects of traditional teaching, in our blended learning model offers an attractive approach for students and should encourage independent learning. Other avenues to consider include developing an 'eBook' for the eMBIS module content. Further work will also be required to investigate the security and robustness of the final product along with consideration of facilities for disabled and international users.

Acknowledgement

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