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STAKEHOLDER PERSPECTIVES ON TEACHING AND LEARNING USING TECHNOLOGY

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STAKEHOLDER PERSPECTIVE ON TEACHING AND LEARNING USING TECHNOLOGY

ABSTRACT

This paper reviews the integration of elearning in De Montfort Institution's largest core undergraduate marketing module and comments on the cost benefits to stakeholders. Three perspectives are considered: student, academic (staff) and institution, followed by discussions on implications for teaching and learning. The pedagogical context and design of the elearning support is reviewed and learning outcomes are discussed in terms of diagnostic, formative and summative assessment. The feedback mechanisms made available to students and the teaching team are analysed and the findings reviewed.

From the student and academic perspectives, integration of technology is viewed as having been successful with teaching and learning outcomes having been positively enhanced. From the institution perspective, the elearning momentum is resulting in a truly dazzling array of choices and it is clear that consideration needs to be given to the strategic adoption of technology. The context of this article is the business and business school domain and relevance to other subject domains is yet to be ascertained although we believe the principles, applications and benefits are generic.

Key words: stakeholders, learning technology, elearning, computer aided assessment

INTRODUCTION

This paper reviews the integration of elearning in De Montfort University's largest core undergraduate module and comments on the cost benefits. We believe there is limited guidance as to best practice in this arena and so offer our considered comments on the perspectives of three key stakeholders in the design, development and delivery of learning and teaching, supplemented by elearning resources.

The paper considers the perspectives of student, academic (staff) and institution and highlights implications for teaching and learning, including the pedagogical context and design of elearning support in relation to learning outcomes in terms of diagnostic, formative and summative assessment. Our feedback mechanisms made available to students and the teaching team are analysed and the findings reviewed. We provide an overview of the interdependencies between the three perspectives and offer our recommendations for best practice in elearning, based on our experiences to date.

BACKGROUND

In United Kingdom (UK) the pressures on Higher Education (HE) establishments to perform to higher standards with a progressively declining financial support from funders and, now, widening participation, is ongoing. On one hand we have HE institutions struggling for survival with increased competition and scarcity of students applying for entry into HE. On the other hand, students are themselves meticulous in their decision making when selecting the Institution of their choice. C'est la vie.

Within this climate, and a very high student number studying our module, we aspired to put a method in place to facilitate a high quality learning environment using learning technologies (elearning). The module at the centre of this paper is Principles of Marketing, is a core level one marketing module. It is the largest undergraduate module within the Faculty of Business and Law and, indeed, the

institution (De Montfort Institution). Students taking the module are enrolled on some seventeen programmes in all, ranging from the usual business programmes to science, computing and arts based programmes. The student cohort is geographically spread over ten sites, including overseas (and growing). Currently, nine sites are franchise, or partner institutions. The module is delivered to approximately 1,000 students each academic year. Clearly, the cohort is large and diverse in nature and has a wide range of expectations for delivery (part-time, evening/day, full-time business related/non-related, working, etc). The teaching team is similarly large – there were some twenty-four lecturers and tutors teaching the module in the 2001-2 academic session and will be a similar number in the 2002-3 session.

THREE PERSPECTIVES

This paper considers the perspectives of three interdependent stakeholders (a fourth may be identified as employers). Key stakeholders in the sustainable delivery of elearning are the students, without whose active support and engagement the facility would not be viable. Similarly, academics, who use the facility to aid their delivery of the module to the student community. Finally, the institution without whose support the facility would not viable!

The key driver for considering the use of elearning was the need to support students with standardised core materials and, through this, provide support for the teaching team in delivering the module, thereby enhancing the learning and teaching experience. Planning for our student's expectations and needs was at the forefront of our strategy.

The size of the module necessitated careful consideration of the design of support mechanisms for students at all sites. Traditional means of delivery ie., lectures and tutorials (small groups of between 15-20 students), allowed for great variety in the inputs (both on the main campus and at partner sites). The teaching team used many of their own materials, naturally influenced by their

own personal styles and preferences, coupled with identification of the needs of various student groups. The variation observed seemed to exist in spite of adoption of a mandatory core text for which the publishers produced the usual support materials (slides and tutor guide). This is not to say that use of wide-ranging and different material is bad in principle. It did, however, present a difficulty with the management of student expectations, particularly at partner sites because they receive only limited standard materials for their module. This was typically in the form of a module overview, tutorial cases and a guide to in-course assessment.

At the outset, the resource had a clear purpose: to add value to the student learning and teaching experience. Harriman and Fitzgibbon (1998) and Jefferies and Hussain (1998) emphasised the importance of instructional clarity in the pedagogical use of technology and cautioned against adoption only for the sake of incorporating technology. It was for this reason that expert advice was sought; the institution's dedicated teaching and learning experts, including technology experts, were brought into the project. Consideration was given to the needs of students, teaching team and the partner institutions, eg., students who had limited experience of elearning resources (it is, after all, a first year module); partner sites where technology usage and capability may be more limited than the main site; many members of the teaching team who preferred more traditional methods of student contact; and, copyright, data protection and intellectual property right considerations.

Volery and Lord (2000) identified ease of access and navigation, interface design and level of interaction; the instructor's attitude towards students, technical competence and classroom interaction; and, the previous use of technology from the students perspective as being critical success factors for the adoption of technology in teaching and learning. They state that technology in teaching enables greater interaction between students and teachers which creates a *"shift in the academic role from intellect-on-stage and mentor towards a learning*

catalyst". This, in turn, results in the ability to take on the more important role of engaging students at different levels. Butler (2000) also considers the ability of technology to add value to the learning environment and raises questions on how to best evaluate teaching and learning outcomes. An increased use of technology allows greater flexibility with face-to-face interaction and provides the ability to be more sophisticated with assessment.

Instructional design must, therefore, build interactions between learners and their environments. Taking an interactive perspective is the crux of any design of a powerful learning environment. Dimensions in these learning environments are, as intimated above, student-centred, knowledge-centred, assessment-centred and community-centred (Bransford et al, 1999).

In order to support the student cohort on the module, a series of lecture notes together with key overheads from the publishers were developed by working closely with the publisher of the mandatory text. Indeed, the publisher of the text gave full support and permission for incorporation of their learning materials into the resource. The use of technology, however, presented some excellent opportunities to enhance learning resources over and above the traditional student-tutor relationship through the creation of computer-aided interactive tasks. With this in mind, the obvious development was to make available to students formative assessment, providing a means to test themselves on their learning through Multiple-Choice Questions (MCQ).

In addition, it was possible to provide links to relevant real-life cases and reports that help students develop their understanding (through application) of the topics. Comprehensive tutorial guides were also developed, again including links, as were a module overview and assessment guidelines. These provided the ideal vehicle for students to make links between the institution's extensive support network and their studies – for example, the on-line library and study skills tutorials. To complete the suite of learning resources, it was also felt that the

support site could provide an easy means of reaching all students with key messages about the module, assessment, tutorial revisions and additional guidance notes. In effect, we are able to offer a more solid infrastructure for communication with and within the student community.

The institution has six faculties, of which the Faculty of Business and Law is the largest. The institution, like many UK HE institutions, is currently cautiously measuring and evaluating the merits of elearning, in serious danger of dazzle from the vast array of learning technologies that have reached the marketplace. At this moment in time our institution is, however, actively engaged in investing in a single Virtual Learning Environment (VLE) that will reside within the new Managed Learning Environment (MLE) technology being installed institution-wide. Cost-benefits in building a sustainable competitive advantage are at the forefront of the institution's strategic planning processes. Clearly, where the needs of a large student community can be served, costs are relatively low in comparison to smaller programmes and modules and the need to embed technology is essential to success within the business community.

LEARNING OUTCOMES

Cost-benefits are measured in terms of the learning outcomes. Pedagogical issues and student formative and summative outcomes are considered.

How effective and efficient are learning outcomes for stakeholders? From the outset we felt that technology can *seem* to take the role of the individual tutor (Suppes, 1966). In the context of a traditional institution, this was undesirable, not least because it is incompatible with stakeholder expectations. Cochran-Smith (1991) emphasised that in order to make technology effective for learning, explicit support by teachers, peers and/or supplementary computer aided learning is crucial. So where does this leave us? We endorse Lowyck's (2002) view in that the key to success is the embedding of technology in a *powerful learning environment* and that pedagogy should be addressed by tackling the

issue of information management. This is addressed by compartmentalising learner functions, including the learning of theory, the learning of tasks, subject matter or domain skills, the kind and amount of interaction, co-operative activities, role assignment and technological characteristics (Santoro et al, 1999). Our philosophy, which recognises that pedagogical issues are of prime importance, has, we believe, been achieved in the delivery of the module.

All aspects of the resource needed to add value to traditional modes of module delivery and this is clearly achieved through the learning outcomes which are specified in terms of both formative and summative assessment. The discussion and message area is particularly useful in providing tips and hints for reading, other module related pointers and institution life which are communicated quickly and effectively. The resource also provided a means for distant students to become part of the main campus community by giving them an opportunity to participate in on-line discussions. Furthermore, all students receive the same presentation of information on the module, irrespective of the campus they are based on, eg., module guide, lecture notes, etc.

Following its introduction in the 2000-1 session, the assessment and contact time for the module was designed to reflect the developments and enhancements made to the teaching and learning outcomes required. Coupled with this, analysis of usage and class attendance figures highlighted that even though the student and teaching team feedback was overall positive of the module there was a significant minority of non-participating individuals. The module was redesigned to include greater contact with students by moving from fortnightly to weekly tutorials. This enabled us to identify non-participating individuals more quickly with a view to re-engaging them.

Assessment was developed in such a way so as to encourage full participation throughout the module's delivery and to 'lock' students into a more regular pattern of attendance. MCQ, as the in-course assessment, was used to test for

wide reading of the subject matter – it was found many students did well to very well in this component, depending on which programme they were enrolled, particularly if they had made extensive use of the resource's formative assessment. This computer-aided assessment (CAA) was, therefore, used in both summative, formative and diagnostic modes. In the diagnostic and formative modes, it was incorporated for each lecture: a quiz allowed students to test their knowledge and understanding as often as they wanted to with immediate feedback on their performance provided automatically. This was clearly a major turn-on for the students, as evidenced in their module feedback!

In the summative mode, CAA was used to test students before the final exam as a part of the in-course assessment protocol (no doubt a key driver for student engagement with the formative mode). The final exam tested for underlying knowledge and used short-answer questions and a report style question, testing for application of knowledge that was linked to tutorial content. The learning outcomes are obviously well embedded into the design of the elearning resource.

FEEDBACK

From the outset, elearning was welcomed by both the student community and the teaching team as a high quality service. Feedback from the teaching team includes –

> *"The website is a major innovation which actually is a masterpiece of forethought – especially the quiz element…"*
>
> *"Students need the confidence to do well… this can only be achieved through high levels of tutor support or a resource based package of the type developed for this module."*

In the 2000-1 academic session, student comments included –

> *"The website was very useful and also the quiz for each lecture was able to show you how much you actually know."*
>
> *"Lecture notes on PC which were easy to access and clear to read. This meant time in lectures were spent listening instead of writing."*

Rather interestingly, both teaching team and student feedback from the 2001-2 academic session is more detailed and explicit in terms of problems and needs. Confidence is clearly growing in both communities as elearning becomes a more generally acceptable mode of delivery. Student comments included –

"If you do have a question you don't get it answered then and there, you have to wait…"

"Not enough specific examples about particular aspects of marketing, just links to other internet sites for cases."

"... the only one thing that could be changed is the menu options, in that there should be less menus and more information on the screen. This will allow the information to be more easily accessible."

"The discussion board was full of too much information. It should be easier to read."

"People do see it as an excuse not to turn up to lectures. If lectures elaborated slightly more from, the lecture notes people would see the lectures as being more valuable."

"Found out phase test result quickly which was good and I found the quizzes very useful."

"You can do it at your own pace and if you don't understand something in a lecture you can look it up on the web."

"Interactive, fun to use, good revision."

"A different approach to learning which works!!!"

and, when asked how we could make this resource more user friendly –

"As well as quizzes, there should be actual brief questions or essay questions."

"More tutor feedback about the site."

"Direct link from DMU homepage?"

"The opening page should be the Principles of Marketing page rather than the default WebCT page."

"Search engine for all information that will be necessary for the tutorial preparation."

"I think it needs a bit more information on it."

Review of student ratings for the contents indicated that the lecture notes, assessment, tutorial learning resources, on-line readings, quizzes and messages were of particular use to students (1-5 scale, 1 = high, respectively, 1.62, 1.95, 2.00, 2.11, 2.22 and 2.24). In the first full year of its use, the web had been visited by 88% of the student cohort. This has risen to near 100% by the end of the 2001-2 academic session because summative assessment was incorporated. Furthermore, results and feedback for in-course assessment are now available to students only via the resource.

This feedback is clearly indicative of the highly positive support for elearning resources in our domain. Users are obviously engaged to such a level whereby they have been thorough in their recommendations for improvements. It is, of course, incumbent on the HE community who make use of this device to improve as experience and expertise grows. From an academic perspective, some of the recommendations highlighted by the student users are already being addressed for the 2002-3 delivery sessions. Without support at an institutional level through appropriate investment in infrastructure, however, there is a limit as to how far the bounds of elearning can be pushed. There are, of course, serious implications for all stakeholders when approaching a 100% student need and usage rate. Furthermore, the elearning momentum is now at such a pace in the HE community – there is dazzling array of choices in support mechanisms and few guidelines to best practice. Having said this, it is surely the only way for us to progress?

REFLECTIONS

Reflecting on our findings in relation to module management issues, it is clear the benefits are genuinely encouraging of the use of elearning, as substantiated by

Scott and Ravat back in 1988, (and particularly of VLE's). The students and teaching team have the found the availability and quality of resources on the module to be highly supportive. The quality of interaction between tutors and students appears to be now more content oriented, rather than the 'problem-with-finding-out' syndrome we more typically observe. Students not only enjoy seeing how well they are doing with the feedback from formative assessment but it also helps them achieve learning outcomes (due, of course, to its embedded nature). Tutors can reach students quickly and easily to enhance their contact time, although care must obviously be taken not to over-burden students on one module. The module's core delivery can be standardised over many partner institutions. The student cohort can be regularly monitored on its progress through, eg., participation in on-line quizzes, hits on messages and learning resources. Assessment can be designed with more rigour to overcome some of the problems inherently associated with MCQs and, moreover, results can be quickly and effectively distributed to all students in confidence and with personalised feedback.

Furthermore, with access made as flexible as possible, students are able to access the resource at any time of day or night and from any location around the World via the internet. This enables speedy response to problems identified, giving both the student and the tutor time to overcome issues while there is still delivery time on the module to do so. The impact of this, however, is the additional loading on teaching team members which is perceived and, indeed, reported by some (but not all). Nonetheless, it has resulted in a proposed redesign of the discussion area to incorporate, eg., frequently asked questions (FAQs).

Given the size of the module, management of students is an extremely important aspect – we need to identify users at different sites and provide usage statistics during the semester in order to facilitate tutors to encourage appropriate learning as well as provide feedback to students. A feature we have made extensive use

of is the selective release of contents for different user groups (teaching team, students at different sites, working on different timetables, assessment release, etc). In effect, the design and implementation of a standardised set of course learning resources can be released and viewed by users according to their needs.

Whilst this can clearly be facilitated within our current VLE (WebCT), it has not all been plain sailing. We have found, in version 3.1, that accessing records in a particular format can be problematic and time consuming. Getting information from WebCT about, say, student performance that includes the required data fields has proven to be very frustrating and has been the most disappointing aspect of the resource from a management perspective. Indeed, having the ability to present professional learning resources which are appropriate to the target users is all well and good but it is equally important to be able to manipulate usage data to provide meaningful output on the student cohort in order to better manage their learning. We are currently investigating how we can better manage this aspect of the resource.

Based on our experiences to date, we are looking to the future and making moves to develop diagnostic and formative tools. We have found severe limitations with current CAA software, particularly in its ability to support open-ended input from students. To tackle comprehension in this subject domain, we have piloted a project that analyses open-ended input to a question for which automatic feedback is provided. We intend this development will further assist students in identifying their strengths and weaknesses. Indeed, there is a great deal of potential for growth and research in this area.

We believe there are benefits over and above any limitations of using this technology. It is an essential part of the learning environment and likely to grow in significance in the foreseeable future. As experience and expertise is acquired

in designing, implementing and managing elearning resources, so this will increasingly be an integrated part of our delivery across the faculty's disciplines.

From our experiences, the skills required to implement technology extend far beyond the writing of any learning resources to be included – not so much a professional endeavour but more a labour of love and ongoing negotiation! It necessitates the expertise of a dedicated technical support team to convert academic content into usable student resource. It is necessary to overcome issues of copyright, data protection and intellectual ownership, training and support, including technical back up, for students and the teaching team. It also needs departmental, faculty and institution level support to develop maintain and enhance on an ongoing basis to ensure genuinely sustainable competitive advantage. Commitment and dedication to its successful integration are, needless to say, a prerequisite.

Our model (figure 1) encompasses our view of the interdepencies between the three key stakeholders.

INSERT FIGURE 1

CONCLUSIONS AND RECOMMENDATIONS

Investigations conducted into the module's ongoing evaluation and specific (qualitative) research with student and teaching team users undertaken to evaluate elearning widely supports the view that technology has been successfully integrated with traditional teaching and learning modes on this module – it clearly adds value to the student learning and teaching experience. Having said this, the processes gone through in order to develop the resource have proven time-consuming, costly and, at times, painful although the encouraging results from the first years of integration has led to wide interest from other module leaders both in this Faculty and across the institution. Indeed, a number of other significant modules have already adopted elearning and

successful dissemination events have been implemented across the Faculty and institution to help support colleagues undertaking similar module reviews.

On reflection, our experiences are generally highly positive and supportive of the use of technology to support teaching and learning. Indeed, it is now impossible to support this module content to the same degree of professionalism by any other means.

By way of a summary of our experiences, we have formulated an action plan that incorporates some potentially useful tips and hints for colleagues, whether they are technically minded or technically supported –

- Use technology for a clear purpose – it must add value to the learning and teaching process and must, therefore, fit in with the learning and teaching strategy;
- Provide a 'reason' for accessing the resource eg., through assessment mechanisms or communication tools;
- Ensure the design is simple to understand and easy to use i.e., 'fit for purpose';
- Give time for training learning supporters eg., tutors, as well as students – and provide adequate guidance on its use in order to integrate technology with traditional modes of delivery;
- Tie loose ends on intellectual property rights, copyright and data protection;
- Monitor usage for purposes of modification and user management to provide maximum benefit;
- Understand the limitations of the platform of choice in order to avoid making time-consuming mistakes – be clear on how the resource is to be integrated into teaching and learning, and the outputs required;
- Test the platform for compatibility with tools that have the plug-in ability to expand and overcome identified limitations.

Commitment and recognition of the cost-benefits at an institutional level is essentially required to identify and ensure sustainable competitive advantage. Not only does this require a heavy investment in terms of continuous research, but also in building appropriate infrastructures supported by hardware, software and expertise. In the current climate of uncertainty for all stakeholders, however, it is easy for learning technologists to sing their own praises. Our evidence suggests that one way of enhancing quality in teaching and learning is to integrate elearning with existing learning and teaching practices.

INTO THE FUTURE...?

Once the dazzle we are currently experiencing with the elearning phenomenon has lessened, what are we left with? What is clear from this paper is the very serious need to address the boundaries between pedagogy and learning technology and, in so doing, addressing the needs of key stakeholders. This will lead to efficient and effective powerful learning environments which are sustainable and provide competitive advantage.

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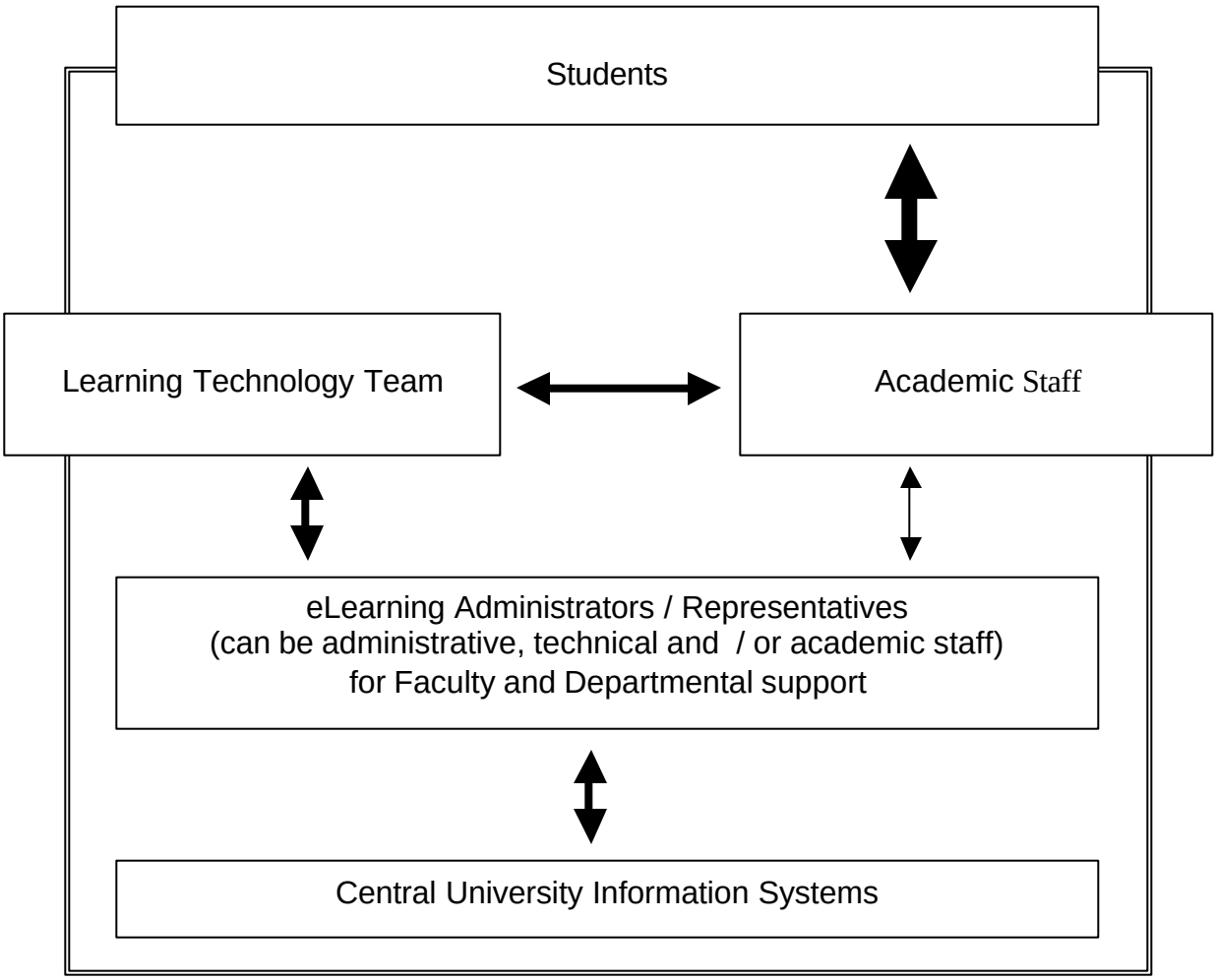
Figure 1 Interdependencies between stakeholders for elearning in HE



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