

E-learning – the best of the old with the best of the new?

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Abstract

This paper provides an analysis of an e-learning project undertaken in a UK university. The paper seeks to investigate what e-learning is and how it works in one university. The background to the project is provided and the value of e-learning is assessed. The paper concludes that a 'clicks and mortar approach' appears to be better suited to the learners but also advocates that a detailed evaluation of the impact of e-learning needs to be undertaken.

Introduction

Gaining an understanding of student learning at university level has not been of central interest in educational research and the traditional model of teaching with a continued reliance on lectures, tutorials and texts still flourishes in higher education.

However the underpinning assumptions of the learning process have been affected by a number of changes in higher education. In particular the growth of mass higher education, the rise of technology within teaching and learning and the involvement of distance and franchise learning have had important implications.

This is captured in the Dearing Report (1997:126):

" While higher education has increased its class sizes, reduced its teaching time, modularised, accepted students without traditional academic preparation, refocused programmes to prepare students for employment, and so on, it has done so on the basis of little evidence of the consequences, and with little research in place to monitor them."

Similarly Laurillard (2002:12) asserts that

"There is comparatively little research on student learning at university level".

The same picture is painted in the USA –

"Student learning frequently occupies a secondary position in internal assessments of higher education" (Hanna, 2000:45).

This paper asks the question to what extent does e-learning offer the opportunity to reinvent some aspects of the style of learning before the advent of the printing press? That learning style could be characterised as individualised learning programmes between tutor and student, mixed with the rote transmission of knowledge and skills. It was highly individualised for two reasons; it was essentially oral and the preserve of the elite. The authors believe that some of the advantages of that style of learning have been lost with the expansion of higher education and consequent economies of scale. It could be that e-learning with its in-built suitability for learners to study at their own pace and place; and to formulate their own programmes provides the opportunity to return to more individual study patterns and widen participation in higher education. The paper therefore seeks to start to investigate what e-learning is and how it works.

Using good ICT compels academics to consider carefully the learning styles of their students and the nature of learning. As it is a novel medium the nature of learning may reveal new knowledge on how students learn, which the academics can learn from. It may be expected that course development and learning approaches will be far more dynamic than before as academics and students discover more about how they learn. It may be that this in turn will change the content and outcomes of modules and courses – delivered in traditional mode as well as using ICT. It may offer the opportunity to shift the focus of academic endeavour from teaching to learning – in practice as well as in theory.

The pressure to increase “learning and teaching at a distance” is not likely to diminish. Indeed the UK Government’s commitment to life-long learning is likely to see increased demand for higher education delivered at a distance. This is because young students are less likely to be able to afford a residential higher educational experience and older students will, because of family and employment commitments, wish to study from home and/or work. This paper provides a background to an e-learning project, outlines definitions of e-learning, analyses the value of e-learning and finally discusses models of teaching and learning on-line.

Developments in e-learning and increasingly sophisticated learning technologies are beginning to make a major impact in U.K. universities. It is clear that universities need to change to accommodate the impact of technology on learning.

Communication technologies that are free from time or place constraints provide new challenges to universities on how they should be organised. Wilson (2000 p.39) highlights this:

“ ..some of the biggest changes for universities will stem from further advances in I.T... a capacity for interactive networking which will connect any university to a global audience”.

E-learning will not be the only factor to change the focus of universities. Other forces at work will include changing employment patterns and opportunities, changing expectations of students, changing governmental and professional requirements, economic development and other technological change. It is therefore difficult isolate e-learning from the factors described above when trying to assess its impact

Background

The core activity of the case study university (University of Glamorgan) is teaching; by what might be seen as the traditional delivery of courses. The University has taught 'qualified' and prepared students by means of lectures, seminars, tutorials and laboratories at the University campus. More recently it has, in common with other universities, employed new forms of teaching such as distance learning and distance teaching. Similarly it has used partners to extend delivery to other locations across Wales and beyond. The partners used include further education colleges, commercial organisations and community sites. In this way it has opened higher education to new students who have been less well qualified or prepared – and with lower confidence levels. It has now been decided to build on this experience, and success, and work with partners in the public, private and voluntary sectors to widen the accessibility of the University's business and management courses through new methods of delivery. This is being piloted through *E-College Wales*, a collaboration in business and management education with the University's partner colleges across Wales, delivered through flexible, shared learning.

This project started with the design of a strategy and then a specification for the use and application of new technologies for teaching and learning, resulting in a successful £2.2M allocation for infrastructure funding. A major development for 2000-01 was *E-College Wales*. This was to represent a significant step change in Welsh higher education. The *E-College Wales* initiative was launched on March 1st 2001 in Brussels. Through it, the University used its established network of partner colleges to support business and enterprise programmes, delivered on-line, throughout Wales in the development of the *E-College Wales* an initiative demanding a managed learning environment (MLE) based on a flexible learning platform.

By autumn 2001, more than three thousand of the University's learners were making full use of a leading edge managed learning environment. The University of Glamorgan had established itself as a leader in the development of production and support systems for e-learning. It is clear that this development has potential benefits for all further and higher education colleges and universities in Wales and further afield who wish to work collaboratively to translate their content into new formats.

The concept of the project is based upon forming an alliance of complementary organisations in the commercial, educational, media, communications, public and voluntary sector to deliver education, training and skills development. The *E-College Wales* initiative provides the additional flexibility of training and support through on-line entrepreneurial programmes. The flexibility of on-line delivery allows the project to remove barriers and enable it to reach an increased constituency of individuals, businesses, particularly those in the small and medium enterprise sector, and public and voluntary sector bodies. European Union Structural Funds support the development of course material and the delivery of the training. Students are able to study at home, at work and on college campus and have access to leased computer equipment, installed in their homes to provide more flexibility. This initiative provides a significant opportunity for the University to evaluate the development, delivery and assessment of this type of e-learning.

By September 2002 the University of Glamorgan will have around 820 on-line learners studying on one of three programmes namely BA Enterprise - 500 learners, Foundation Degree in Business Administration – 180 learners and the MA in Professional Development - 100 learners. In addition, there are a number of other web based teaching and learning initiatives.

Defining E-Learning

E-learning has many definitions and may encompass all or some of the following, technology-mediated distance learning, internet based, intranet, CD ROM, simulation, strategy, game playing, video discs, multimedia and communications (e.g. e-mail or web based chat room.). A move from e-teaching to e-learning moves through the following steps:

1. No use of electronic media
2. Materials available on the web
3. Effective communications linking academics and students
4. Interactive materials available with student tracking
5. Context sensitive access to on-line resources
6. Synchronous sessions managed by an ICT system
7. Effective, and secure, on-line assessment
8. Knowledge management systems for support

9. Integration with management information systems
10. Rich media options available
11. Meta-managed system with compliance with international standards.

To locate this discussion within the University of Glamorgan *E-College Wales* learning context our definition is that e-learning is a web based, higher education accredited programme, delivered over the internet, using a managed learning environment, mediated by tutor led synchronous and asynchronous discussion groups.

The scheme (BA Enterprise) is operated and supported by an existing higher education institution through the use of a MLE called *Blackboard*. We have adopted what is sometimes referred to as ‘clicks and mortar’ learning (on line programmes backed by face-to-face ‘tutorials’ and pastoral support delivered at a network of physically dispersed sites). We believe that this approach will be more effective than purely on-line learning at a work or home terminal (the lonely learner). The *E-College Wales* programme is a deliberate testing of the ‘clicks and mortar’ philosophy and of costing and pricing issues.

“The beauty of the Web is that it provides an entirely new context for teaching and learning. It removes the physical and time constraints for *instructors* as well as learners. Moving a course to the Web presents the perfect opportunity to return to the core principles of teaching and learning to create a new pedagogical model for our practices” (Boettcher, 1999).

E-College Wales has provided us with the opportunity to test new approaches to learning – to see if e-learning does indeed exploit the Web to the benefit of learners or whether it is merely a different as opposed to better medium for learning.

The Value of E-Learning

One of the essential features of e learning is the freedom from constraints of time and place, which it allows. This characteristic is seized upon by advocates as the driving force behind global, borderless learning. Running *E-College Wales* has enabled us to test its validity. *E-College Wales* students access the Web site every hour of the day

and night, this is illustrated in Appendix (table one). Similarly table two in the appendix reveals that students access occurs every day of the week also.

The potential value of e-learning falls into many areas. The cost of training in terms of travel and accommodation is reduced with a virtual environment. This type of delivery offers considerable flexibility; for example large firms with distributed populations could improve internal communication without incurring high costs by using on-line delivery. Employee development is a particular issue for large companies with geographically dispersed workforces as it is for professions seeking to maintain their currency in a global environment: e-learning provides a potential solution - employees are able to access learning, as and when required. In addition it provides a means of linking rural areas and overcoming the reluctance of the rural population, be it based upon poor communications or lifestyle or working requirements that are at odds with conventional campus delivery. One of our first students on-line was a farmer from rural West Wales who was not close to a college and did not have the time to travel. The e-learning project made education accessible for many students who would not have had the opportunity otherwise.

Equally important the medium could offer the opportunity for learners to take control of their own learning, ie the pace of their study, the sequence of their study and ultimately frame their own learning programmes. This could have considerably more implications for continuing professional development, higher level training and postgraduate research programmes.

Model of teaching on-line

At the start of the project staff were inexperienced in e-learning and in order to kick start the development the University bought in support from Gilly Salmon who had developed an e-moderator on-line training package for the UK's Open University. Over forty staff received training in e-moderating and *Blackboard*. The University's target is that 2003 will engage all academic staff with the new technologies. To underpin this it will be necessary to develop a strong platform of expertise in the University's schools to enable peer supported targeted staff development. It is anticipated that learning and teaching groups will be key players in this respect. It is intended that staff development is taken on board not only by academic staff but also

support staff, students, validation panels, external examiners; in fact all stakeholders across the range will have to adapt to this change.

The model of e-moderating put forward by Salmon (2000) has five stages:

Stage One: Access and Motivation

It is essential that students are able to gain access quickly and easily to the managed learning environment of (in our case) *Blackboard*. The University's Business School provides technical help through a telephone help-line in addition to tutor support via email and telephone. In addition the importance of a good induction programme should not be under-estimated. Although Salmon (2000) advises against face to face meetings during induction, but we have found that this is more effective for our "clicks and mortar" approach and helps improve student motivation on-line. This will be discussed in more detail later in the paper.

Stage Two: Forming Relationships On-line

Students becoming more familiar with the new environment are able to "socialise" on-line. However, the familiar cues from oral and non-verbal communications are missing and new patterns of socialisation emerge. Although it could be argued that the student experience is diminished because of this it could equally be argued that there are fewer distractions and more equal opportunities for participation. The tutor in this phase ensures all students contribute although he or she needs to be aware of some students biding their time; Salmon (2000) refers to this as "browsing". It is clear from Salmon's experience of on-line learners that as chatting on-line increases a sense of belonging develops. Tutors are able to help facilitate this alongside other support activities amongst which are: promotion of mutual respect between participants, defusing problems, offering advice, and providing guidance and academic counselling.

Stage Three: Information Exchange

Both module content tutors and knowledge officers prepare Frequently Asked Questions (FAQ) sections for ease of reference. Advice on academic issues is also provided. Information exchange is also facilitated through the MLE software via the virtual classroom, coffee shop, feedback and other geographic groups.

Stage Four: Knowledge Construction

The expectation at this stage is that students interact with each other in more participative ways, constructing knowledge for themselves and helping each other in clarifying academic issues. The tutor becomes less involved and contributes when necessary.

Stage Five: Development

Students now become more responsible for their own learning and generally will need less support. At the higher levels of under graduate and post-graduate studies the skills of critical thinking and the ability to challenge the givens are in evidence at this stage.

Thus tutor involvement changes through the stages; in the first stage technical and academic support may be equally important whilst thereafter, academic support increases up to and including stage three and decreases thereafter.

The model for teaching and learning on-line remains an area where an improved level of understanding is required and further research needs to be undertaken. Salmon (2000) bases her model on extensive experience with Open University students and corporate clients. It will be interesting to see whether the model is generalisable to first year undergraduates on the *E-College Wales* programme. Staff have been trained using the Salmon model but are now being encouraged to reflect on their experiences during the first year.

New Theory of Learning?

The move from the teacher imparting knowledge to one where focus is on enabling the student to learn Laurillard (2002) refers to as mediated learning, Bork (2000) as adaptive learning and Hanna (2000) labels this as engaged learning. They build on the early works of Dewey (1916) and Vygotsky (1962) who argue that learning occurs most effectively when it is connected to the personal experiences and knowledge base of the learner. Both Dewey and Vygotsky also stress the importance of learning being situated in a social context where the learner leads the construction of her or his knowledge through interaction with others and with guidance from the tutor. This constructivist theory of learning rejects the classical model of passing on knowledge and emphasises active engagement rather than passive reception. Laurillard (2002: 67) notes that:

" Constructivism is a broad church, encompassing all educators who reject the transmission model of teaching or anything that sounds non-cognitive".

Evans and Nation (2000: 175) emphasise

“The requisite pedagogical theories – commonly branded as constructivism- have established themselves, at least, as respectable movements”.

Relan and Gillani’s define Web-based learning (1997) as:

“The application of a repertoire of cognitively oriented instructional strategies within a constructivist and collaborative learning environment, utilizing the attributes and resources of the World Wide Web”.

The role of the educationalist in the on-line setting is effectively changed from a deliverer to an enabler. The view that the role of the lecturer is to enable students to learn becomes enhanced by the role which technology can play.

One of the skills for the educationalist to develop is the initial creation of a learning environment where peer learning and the management of the resultant individual and group interactions is undertaken in an effective way. Added to this is skills development related to the use of the technologies which support highly interactive learning groups. But the key factor is that of time management. The technology uses individual student time with no regard for institutional timetabling. Students can spend far longer engaging with subject content in an on-line environment than they do in the classroom and the relevant information requests and exchanges can use up considerably more time than envisaged. This will be examined later in the paper.

Horton (2001) is very critical of the way e-learning courses are designed using pedagogical principles which fail to address the underlying design philosophy.

According to Islam (2002)

"Fortunately for e-learning professionals, there is a principle that has proven to be effective in holding the interest and satisfying the requirements of the adult learner population"(p2).

This principle is androgogy, which is a learner centred approach more applicable to adult learning. Brookfield (1986) identified that adult learners already bring to the learning situation their own set patterns of learning, values, attitudes and varied experiences. As a result adults approach the learning situation with many and varied

expectations of the learning process. Thus adult learning is most productive when lecturers act as facilitators rather than didactic instructors. Adult learners like to be engaged in the design of the learning and to be able to perceive the learning as relevant to their situations. They like to feel that their past experiences are being used in the learning process. In other words this is androgogy and using this philosophy of learning, e-learners are asked what they want to learn, how they want to learn and when do they want to learn. It is interesting to note that at present most e-learning courses are not yet identified as using either pedagogical or androgogical principles.

Lessons Learned

During the past six months of delivering on-line the enterprise project a number of important lessons have been learned, they are detailed next.

Induction

There was a one-day induction programme organised for the first cohort of *E-College Wales* students (ECW1) students. Gilly Salmon (2000), as discussed earlier, had advised tutors not to start with face-face meetings for induction, as this would discourage the development of on-line socialisation. After some thought and discussion we decided to offer a one-day face to face induction. The feedback from students has been unanimous, they all complained that the induction process was too rapid and they need more up-front *Blackboard* training as part of the induction. Tutors also felt that many of the problems in the early stages of delivery e.g. technical problems, familiarisation of the *Blackboard* environment, could have been avoided with a more detailed induction programme. We have now addressed this, the induction for ECW 2 has been expanded to 3 days and it has been proposed that this be further expanded to 4 days for the September 2002 cohort. Those students with weak IT skills are offered more IT training and all are given a thorough grounding in *Blackboard*. The feedback from ECW2 students on the induction programme has been very complimentary. One of the early lessons learnt was that given a very diverse set of backgrounds we could not assume that all new learners came to us with the same or even similar experiences or skills. This may run counter to Lippmann's (2002) assertion that:

“the educational environment is no longer fixed and stable. It is evolving faster than the rate of turnover of teachers or educators. Therefore, the nature

of the profession and the workplace will change whether we like it or not. It is a mistake to think of this as introducing learning technologies—it is a matter of keeping up with the learners.”

For our experience is that whilst that is true with some students it is not always true – many older students lack confidence and experience. Lippmann’s assertion may be more consonant with younger learners’ experience and expectations. Resolving this apparent tension will be essential. It suggests that thorough diagnostic analysis of each student’s expectations, capabilities, experiences and needs should be undertaken before e-learning programmes start.

Delivery Model

We learned very quickly that the on-line student experience is very different from the traditional student experiences. Students on-campus find it easy to move from one lecture topic to another and from one module to another during any day at college. This may be because teachers are expert in this approach having built up their expertise over many years – similarly students may find this accords with their own prior experience and expectations. The e-learners generally found this difficult - they were asking for guidance on which module they should start with and would then want to complete that before moving onto another module. To be offered all six modules at the start with full control given to the students as to which order they accessed the content was too much of a leap from traditional learning for most of them. They were asking for blocks of learning. In ECW 2 we have changed the model of delivery. This has suggested to us that a more cautious is required to students determining their pace or sequencing of study programme is necessary, especially early on. Greater self-determination may come later as student confidence grows because of structured guidance from the teaching team.

We are now trialling a modified linear delivery model. This involves the Enterprise Competency module to be studied in the first eight weeks - thereafter two further modules will come on-line. The rationale for this order is that we can continue to monitor and support IT skills though the content of the Enterprise Competency module. The students only have to focus on this model in the first instance. Although it is too soon to comment on the success or failure of this approach evidence to date is

encouraging. The number of ‘hits’ on *Blackboard* has quadrupled comparing ECW1 and ECW2. Moreover there are far less technical questions posed by ECW2.

Content/Assessment

We learned that you cannot take a traditionally delivered course and put it on-line. This has been highlighted in the way students undertake tasks which are part of the formative assessment. Students are spending a lot of time reflecting on the tasks. When tutors designed the tasks it was thought that they would be equivalent to a group discussion in a lecture or a question and answer session in a tutorial. In fact they has not been equivalent to either of these experiences and consequently we have provided over-burdensome assessment. The students have also complained about the number of tasks they have been expected to complete. We have removed a number of the formative tasks and in particular those tasks that were not related to the summative assessment. We are re-evaluating the assessment and seeking to find the right balance between learning activities and time given for completion.

One of the most important issues to bear in mind in the e-learning environment is that the lecturers may not be there to explain complex ideas and resolve ambiguities, so the materials have to do this for them. Content should be presented in relatively small chunks. We found that it is better to present a single new concept or idea and then to engage the learner by making them interact with the material, the tutor and each other. In other words the more traditional method of lecture followed by seminar or tutorial does not translate successfully to the e-learning medium. The traditional on-campus approach may have originated from the transmission of knowledge and skills rather than a more intellectual learning exercise – and then been retained for reasons of convenience. For on-campus students it is more practical for staff and students to arrange learning in long blocks, rather than bite-size chunks. The availability of e-learning techniques for on-campus students encourages universities to re-examine how put together higher education – be it to acknowledge Lippmann’s (2002) observed new technologically literate students or to provide learning opportunities in the way described above to suit all learners.

It is also essential in the e-learning environment that content and learning activities do not follow the “lecture feeding into tutorial” model. It is far more appropriate to

integrate all learning activities with academic content, allowing students to access learning opportunities more flexibly. Learning resources and learning activities will have to be integrated to provide effective learning opportunities, according to generally accepted open learning principles (e.g. clear and explicit outcomes, flexibility and use of self-assessment questions). Inclusion of dynamic hyperlinks allows learners to easily navigate through on-line content and activities. In addition the structuring of access to relevant teaching materials is an important feature to consider.

Staff development

Right from the start of the project staff development was identified as a crucial element without which the project could not succeed. The very different nature of the students' learning experiences would mean that it would be essential for there to be a structured staff development programme for all of the staff who were to be involved, followed up with rigorous evaluation and reflection.

Prendergast (2001) highlighted the importance of this and notes that:

“many organizations failed to plan for realistic staff training, when introducing this medium. This often resulted in people with little or no understanding of the medium being expected to undertake tasks of which they had insufficient knowledge. The hardest part of introducing CSCL was to motivate and train the educators and trainers” (p2).

There are psychological problems of staff in the University feeling threatened and insecure. It is apparent that some staff feel their jobs are being threatened by technology and others who feel unable to cope with the technological changes and are consequently feeling insecure. The responses have ranged from those who lament the growth of technology and foresee a loss of human interaction to those who see the changes as control mechanisms brought in by management and reducing their power and autonomy. There is clearly a major staff development agenda associated with a change of this magnitude. Those threatened by lack of technical expertise may be assisted easily and quickly with training but those with negative attitudes, who feel their power base or core values are being threatened will be more difficult to change.

Prendergast (2001) noted a number of concerns affecting educators including the issue of “technofear” especially amongst traditional older teachers. He reported that

“it is hard to change the mentality of some teachers” (p2).

Student Support

The nature of student support changes not least because the nature of the students. Students have already changed and can be expected to continue to change. Students in an e-learning environment are more autonomous learners. They are geographically distant. They come from more diverse backgrounds and are far more likely to see themselves as clients as well as learners or students. Thus the nature of pastoral and educational support changes with learning resources professionals, administrators and IT staff all providing the kind of essential support to learners that has traditionally been the preserve of academics. This change brings with it attendant stresses on resource allocation and professional expectations.

It became clear at the start of the project that a range of staff, academic, technical, administrative and staff with new composite skills from different departments across the University and across the Welsh further education network needed to work together. Existing administrative structures were problematic and hindered interdisciplinary arrangements. The development of an e-learning environment led to the creation of multi-disciplinary teams, including staff from Academic Registry, Learning Resources Centre, Human Resource Department, Marketing, Student Information Systems, Information Systems, Student Services, the partner colleges and the academic schools. It is clear that the success of the project rested upon an integrated team involving all the University's support departments working alongside the Business School from the beginning. In an e-learning environment the support is required at the start and is immediately transparent to the e-learner when they log on-line. Nunan et al. (2000) highlight the importance of integration:

"Information technologies are bringing structural change to serve areas, causing a convergence of roles and functions between registry, library, corporate services, production and teaching support and student services" (p72).

The blurring of traditional departmental boundaries has been particularly evident in the development of modules on-line and represents an important change within

universities. It was also to include an active programme of recruitment of staff with the expertise(s) necessary to deliver via a high quality managed learning environment. The new paradigm has also created new relationships between further education partners and between further education and higher education. Further education staff, and colleges, are assuming new roles which will necessitate new agreements, funding models and quality controls. These changed roles will also threaten the prevailing hierarchies and pre-conceptions about the status of further education vis a vis higher education.

Students have requested more feedback and guidance from tutors. They would also like weekend or summer school face-to-face sessions built into the programme. The guidance and feedback from tutors across all colleges has not been consistent. Some colleges have not provided enough on-line support to students and this becomes very transparent in an on-line environment. Students are able to view differing quality of feedback across eight colleges. We are organising Saturday schools, which are student-led. This gives the students an opportunity to share any problems and generally catch up if they are falling behind. The associate colleges have been asked to make comparable arrangements.

Learning Resources Centre

The development of the *E-College Wales* relied heavily on a number of other parallel developments being in place, which support and enhance its role. One of the key supporting areas was the Learning Resources Centre (LRC).

The LRC offers a range of facilities based around

- a resource cataloguing system (OPAC),
- the provision of electronic access to journal articles (ABI, EBSCO, Web of Science etc.),
- the development of subject gateways.

The whole student learning experience is reduced if the material is unobtainable due to a poorly designed or simply unusable interface. Similarly the most dynamic and exciting package will be badly received if the academic material is unsuitable. At the broadest level it is a simple task to provide a link from within *Blackboard* to the LRC

home page as a general service for teachers and learners. However this broad-brush approach does not make most effective use of the LRC's facilities. At module and topic level it offers a more refined service providing direct access via LRC systems to particular resources, whilst at the same time offering an opportunity to avoid a reductionist approach. This has been achieved through a four level approach including System Level, Subject, Module and Topic.

The clear implications of adopting this approach is the requirement of a close working relationship between lecturers and LRC staff to ensure that:

- links remain current
- the LRC's subject gateways remain current
- new resources are brought to the attention of lecturers.

Thus Learning Resources is brought to a central and crucial role both in the short term and in terms of more strategic development considerations. This is a significant feature that moves non-attending students away from the previous possibly limited on-line information availability that will have simply consisted of access to OPAC and the on-line catalogues through the University homepage.

This move of LRC support to centre-stage has been problematic, as there is a potential threat to lecturer autonomy. Content materials have been changed where copyright clearance has not been given but this restraint is new to lecturing staff.

The time factor

Use of the technology uses individual student time with no regard for institutional timetabling. We have found that students spend far longer engaging with subject related material in an on-line environment than they do in the classroom. The associated information requests and exchanges can use up considerably more time than envisaged, or planned for, which in turn can lead to an unanticipated build up of problems for both the tutor and student. This may indicate some of the weaknesses in the scaffolding provided, in that students spend more time in the first learning cycle before being prompted to move into the second or the student may have been experiencing a more fundamental problem, for example, the expiry of their password.

Whilst it is agreed that learning to a large extent, is determined by complex interplay within the student group, they are contextualised to a degree by the tutor who constructs the context and/or learning activity. Within the discussion forum students learn from each other and form groups of learning practice thus they develop and learn about a range of peripheral matters as well as the objectives related to the course. This all takes more time on-line than as experienced in the classroom

Examples of this we have seen are students arranging to meet at pre-arranged times in the “coffee shop”, to exchange information and views on particular subjects thus forming their own discussion group. This has been noticed in particular where the course has required students to undertake a series of short unassessed tasks and to report back to the discussion forum. Initially this was an inconsistent arrangement with some students taking the lead and others not contributing at all. When one of the tutors posted a notice to say that he would be in the coffee shop at a particular time to contribute to these groups, the level of participation rose significantly. Simply knowing the tutor was available encouraged a response, which says a considerable amount about the student's perception of the role of the tutor.

The many changes occurring as a result of moving into e-learning are summarised in appendix (Table 3).

Conclusions

There is little doubt that e-learning is a major factor shaping the future of higher education. As Inglis et al (2002:189) indicate,

“ For most organizations, the transition to electronic delivery will represent a significant shift. It will involve major changes to the organization: changes in staffing, procedures, infrastructure, and most of all to the culture of the organization”.

As David Seymour, President of Qsystems, claims:

“We are kidding ourselves if we believe that educating people for the year 2000 is essentially the same as educating them for the year 1975. Everything has changed – technology, lifestyles, and cultures. Our educational systems must change as well” (Buck 1997 p.19).

The *E-College Wales* project provided the impetus for the University to reconsider its processes and organisation but without this strategic change the project would have faltered at the outset. To be effective in this new era it is important that higher education recognises the powerful external forces of life-long learning, new global competitors, and the developments in learning technologies. The agenda of the UK Government focuses on the 'knowledge economy' and the potential of information technology to reach groups of people previously excluded from access to education thus facilitating the widening of access. This paper provides an insight into how one university is dealing with these challenges.

E-learning is not without critics; e.g. Light and Colbourn (1997) point out that

"learners frequently stated they do not wish technological solutions to replace face to face teaching".

Widespread misunderstanding surrounds the meaning and significance of e learning. E-learning may be likened to an impressionist painting where each can see what she or he wants to see. Clear definitions are vital, as is an acceptance that one size does not fit all in e-education. ICT offers the opportunity for flexible programmes designed to fit the needs of a unique learning group, including the potential for individually tailored programmes. As with all IT driven change, e-learning will develop more slowly and less smoothly than its advocates predict, but with far greater consequences, ultimately, than most assume.

It is too early to answer the obvious question "does e-learning work?" What can be said however is that e-learning can widen access to education (physically, culturally and socially) and can be student-centred. It encourages a greater engagement with learning itself and greater individual learning. The University has entered e-learning with a well thought-out strategy and implementation plan. Boundaries between academic and support departments are becoming blurred. Likewise the relationship between the University and its associate colleges has moved from a franchise "parent-child" relationship to one of "adult-adult" relationship, as the associate colleges increasingly are equal partners in delivery and innovators in e-moderation. The University is no longer the only innovator. Universities will need to reorganise, blurring boundaries between departments, disciplines, and relationships with other colleges and organisations in all sectors. E-learning appears to be a significant change

agent in the case study university and the implications for changes in higher education are clear.

Laurillard (2002:3) stresses

“The academic system must change.... As higher education expands, we cannot always rely on the human ingenuity to overcome its inadequacies. It is always possible to defend the inspirational lecturer, the importance of academic individuality, the value of pressurising students to work independently, but we cannot defend a mode of operation that actively undermines a professional approach to teaching”.

The changing nature of knowledge and information means that successful universities will be those that respond quickly to, and with, technological innovation. They will have to pick winners in terms of courses, markets and technologies. They will have to publicise their successes and ensure that they can continue to demonstrate that they have a quality product that adds value and is innovative/novel. The successful universities will be those who organise higher education for the benefit of students, employers and training organisations, rather than for the staff of the institutions. This will not be achieved unless the content and technique are thoroughly underpinned by current research and scholarship. Universities will have to display a dynamism and speed of response that does not sit comfortably with the more reflective academic mode.

So does e-learning provide the best of the old and the best of the new? It is far too early to make a judgement with conviction supported by practical evidence. However we have observed that there is exciting potential. Pure e-learning (solely at a distance) may open up higher, and other, education to new markets – and does offer the opportunity for the students to determine their own pace of study, their sequence of study and even their own programmes of study. However it does not provide face-to-face contact between staff and students or students and students, with the associated opportunities for informal as well as formal learning. Chat rooms can go some of the way to mimicing real inter-personal interaction, but most students see e-interaction as an addition to, not a replacement, for meeting people. E-learning is a flexible medium – and if delivered at high quality does add something new to educational experience. It can provide a frame for managing students with differing

expectations, experiences and abilities. It can allow students to develop their own learning styles and programmes – but our experience suggests that many students do not feel at ease with this level of responsibility and welcome a strong guide in the early stages. The “clicks and mortar” approach followed by *E-College Wales* is one way of bringing the best of both worlds. However it is not easy, nor is it cheap. There is a need for further investigation, piloting of other approaches and evaluation of the pilots.

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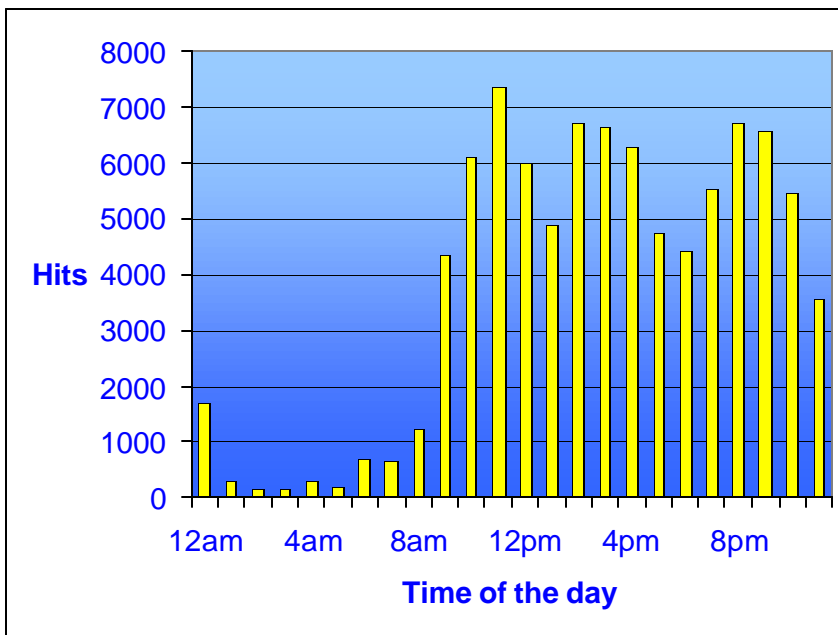
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Appendix

Table one

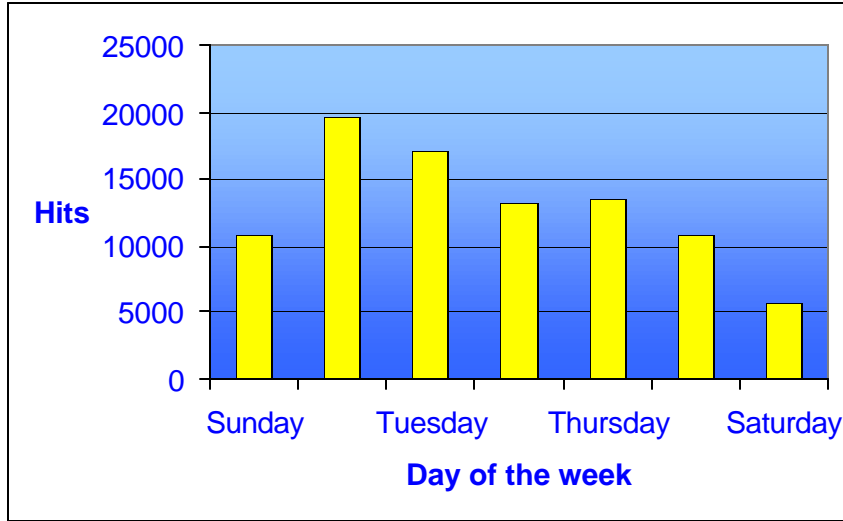
Hour of the day	Hits
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Hour of the day	Hits
12am	1690
1am	287
2am	153
3am	131
4am	317
5am	217
6am	709
7am	648
8am	1257
9am	4324
10am	6116
11am	7348
12pm	6001
1pm	4876
2pm	6730
3pm	6657
4pm	6300
5pm	4752
6pm	4434
7pm	5532
8pm	6709
9pm	6594
10pm	5477
11pm	3567

Table two

Day of the Week	Hits
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Sunday	10782
Monday	19624
Tuesday	17158
Wednesday	13269
Thursday	13436
Friday	10752
Saturday	5805

Table 3**Characteristics and assumptions of traditional and e-learning Universities**

Input	Traditional Characteristics and assumptions.	E-learning characteristics and assumptions.
Place of learning	Students come to the University Campus	Students based anywhere working from home or place of work etc.
Mission	Defined by quality of teaching	Defined by quality of Service and Support.
Funding	Measured by FTEs – hours of input/learning hours	Based on learning outcomes
Curriculum	Relatively stable	Dynamic (but within prescribed curriculum outlines)
Instruction	Primarily face to face, mainly teacher-centred	On-line students centred
Faculty	Full time members of staff emphasis on instructional quality	Fulltime and part time Staff with emphasis on quality of support
Students	Meets admission requirements – variable on-going measurement of change in overall learning.	On going assessment of individual students progress. Formative assessment in the public domain.
Library	Increasing volumes in library	On-line resources / journals. Collaborative libraries
Learning Technology	Used to supplement or enhance lectures	Central teaching process