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E-learning: You Don't Always Get What You Hope For

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Abstract

Despite substantial growth in the use of information and communication technologies (ICT) throughout western societies, there is much evidence of technology-led innovations within Higher Education (HE) failing to achieve the anticipated transformations in learning and teaching. This paper reviews evidence from research and evaluation studies relating not only to e-learning, but also to wider HE practices. It argues that the use of ICT does not, *in itself*, result in improved educational outcomes and ways of working. It considers contextual factors that are of greater significance in determining *how* and *why* e-learning is used in HE. Students' engagement with e-learning relates to their expectations and conceptions of learning and to assessment demands. Academics need to re-assess their own beliefs and practices concerning teaching and assessment and their impact on the experience of learners. Both teachers and learners need to understand *why* e-learning activities are to be undertaken and the rewards expected to be derived.

Keywords:

Assessment, constructive alignment, e-learning, learning outcomes, teaching approaches, student learning.

E-learning: You Don't Always Get What You Hope For

Introduction

Information and communication technologies (ICT) are increasingly being used throughout the world for a very wide range of purposes. In western countries in particular computers and the Internet are used extensively in the workplace, in education and in the home (Madden, 2006; National Statistics, 2007). There has been a growth in the use of ICT for learning, both formally and informally. Students in schools, colleges and universities use ICT to support their studies, even if this is not officially part of the curriculum requirements. For example, an Internet search engine such as Google™ is now the preferred starting point for many learners when looking for information and online resources such as Wikipedia™ are consulted frequently (CIBER/UCL, 2008; Conole, de Laat, Dillon & Darby, 2008; Dutton and Helsper, 2007), particularly when assignments are being undertaken.

Over the last 10-15 years there has been a substantial growth in the use of ICT in Higher Education (HE) throughout much of the world. However, it has not always been obvious precisely *how* ICT was intended to support teaching and learning and a number of different agendas have been prominent in various contexts. According to the stated policies and strategies of governments and HE institutions, increased use of ICT is intended to help achieve one or more of the following purposes:

a) to facilitate a substantial increase in student numbers in HE without a proportionate growth in expenditure;

b) to provide more flexible approaches to teaching and learning without compromising the quality and standards of the HE experience;

c) to widen participation in HE by catering for a more diverse range of students;

d) to facilitate the involvement of learners (and sometimes teachers) located in more than one country or continent;

e) to help prepare learners for living and working within technology-rich environments and societies.

Over that time, various terms have been used to describe the application of ICT to learning and teaching, including *Computer-assisted learning*, *e-learning*, *Networked learning*, *Online learning*, *Telelearning*. *Technology-enhanced learning*. Each term has tended to be applied in an imprecise way to describe a diverse range of educational activities, and although the word 'learning' has generally been employed, in practice the focus has more often been upon 'teaching' with technologies. *E-learning* is probably the most widely used term, but as Mason & Rennie have pointed out, "Definitions of elearning abound on the web and each has a different emphasis; some focus on the content, some on communication, some on the technology" (2006, p. xiv). While being fully aware of the vagueness associated with the term, I will use it throughout in a broad sense, to refer to "learning facilitated and supported through the use of information and communications technology" (JISC, 2004, p. 10).

The author has been reviewing, monitoring and evaluating developments in e-learning in HE over an extensive period (Kirkwood & Price, 2005). Usually, the particular focus has been on the *pedagogical function(s)* that an application, tool or system was intended to fulfil and the *experience of learners* in attempting to make use of them. In terms of more formal support for teaching and learning in HE, ICT has very often been adopted to enable one or more of these functions:

- *Presentation* – making materials and resources (text, data, sounds, still and moving images, etc.) available for students to refer to, either at predetermined times or 'on demand';

- *Interaction* – enabling learners to actively engage with resources, to manipulate or interrogate information or data, etc.;

- *Dialogue* – facilitating communication between teachers and learners or between peers for discussion, co-operation, collaboration, etc.;

- *Generative activity* – enabling learners to record, create, assemble, store and retrieve items (text, data, images, etc.) in response to learning activities or assignments and to evidence their experiences and capabilities.

There is the potential for ICT to *extend* or even *transform* what can be realised in HE teaching (Garrison & Anderson, 2003). ICT can make possible learning activities or situations that would otherwise be extremely difficult to achieve and to facilitate qualitative improvements in learning outcomes. However, to date much e-learning has tended to *replicate* or *supplement* existing academic practices, particularly when used in 'blended' contexts (e.g. Cramer, Collins, Snider & Fawcett, 2007; Evans, 2008; Stephenson, Brown & Griffin, 2008). Many HE institutions now have some sort of Content Management System or Virtual Learning Environment that provides students with access to a wide and integrated range of tools and services to support their learning activities. However, the extent to which teachers and learners both use and value these facilities is highly variable, even within a single institution (e.g. Blin & Munro, 2008; Mahdizadeh, Biemans & Mulder, 2008).

Disappointment with E-learning in Higher Education

Despite huge investment in infrastructure by governments and individual institutions, there is much disappointment in HE in terms of effective use of e-learning – disappointing levels of uptake, of engagement, limited development of 'learning communities' in HE courses. Such findings have been reported both in campus-

based blended learning contexts and in distance education (see, for example, Becker & Jokivirta, 2007; Fung, 2004; Kreijns, Kirschner & Jochems, 2003).

High-level policy statements and institutional strategy documents have a tendency to make claims about the impact of technologies upon student learning, often with little or no supporting evidence and insufficient understanding of the complex relationships involved. For example, the current Strategy for E-learning of the Higher Education Funding Council for England (HEFCE, 2005) assigns technology a central role within the process of transforming HE practices. This is not atypical: in the literature it is common to find technologically deterministic statements asserting that the use of ICT for teaching and learning will bring about desirable changes in students' learning behaviours. Finding evidence in support of such claims is much more difficult.

Almost all students in the UK make use of the Internet and they are the most active users of online entertainment and social networking sites (Dutton and Helsper, 2007). In the USA, where technologies are widely used throughout the education sector, a recent large-scale investigation into their use by undergraduate students found that information technology was often taken for granted and integrated seamlessly into their daily lives (Caruso and Salaway, 2007). That survey found that students were generally positive about the contribution of technologies to their courses. However, only 61% of the respondents agreed with the statement 'IT in courses has improved my learning', and fewer (58%) felt that 'Overall, instructors use IT well in my courses'. The fact that many students are using ICT for their studies cannot be equated with e-learning being effectively adopted in HE, because so much of what students do with ICT is self-initiated and might or might not enhance their learning.

So in many western countries we have a paradoxical situation. Access to and use of ICT is high throughout society and particularly among young people at school and in HE. While a large proportion of HE students use ICT to support their learning, many

make only limited use of systems set up within institutions to augment formal teaching and learning activities and often express disappointment about the contribution offered by e-learning opportunities. When e-learning is introduced within HE courses, teachers often find that the outcomes are not as positive as they would expect. Often, there appears to be a disparity between the *potential* learning benefits that are claimed for e-learning and the outcomes from *actual* learning activities and experiences that are observed in practice (see, for example, Zemsky & Massey, 2004; Becker & Jokivirta, 2007). When it comes to e-learning, both teachers and learners don't always get what they hope for.

Exploring an apparent paradox

The apparent paradox of high access and low use of ICT, albeit in the context of High School education in the USA, was explored by Cuban, Kirkpatrick and Peck (2001) They found that teachers' use of technologies tended to maintain rather than alter existing classroom practices and they argue that routine instructional practices have been retained "because of contextual factors rather than individual factors of hostility to technology, inertia, or passive resistance" (p. 827). They cite contextual factors such as time schedules for classes, departmental organisation, external tests and teachers' disciplinary training as important constraints. In a review of research and evaluation studies of the impact of e-learning in higher education, Kirkwood and Price (2005) have argued that technology-led innovations do not *in themselves* lead to improved educational practices. Too often technologies have been introduced to university teaching with little or no consideration being given to the implications for student learning. Their conclusion is that "although ICT can *enable* new forms of teaching and learning to take place, they cannot *ensure* that effective and appropriate learning outcomes are achieved" (p. 260).

Evaluation studies point to reasons underlying the under-performance of e-learning within the formal context of HE. Introducing teaching innovations within existing HE structures is highly complex and this article argues that contextual factors are the main determinants of how and why e-learning is used effectively (or not) by learners and teachers and that these have little to do with technology *per se*. The focus will be upon two underlying factors:

(i)   variations in users' conceptions of teaching and learning, and

(ii)   the primacy of assessment requirements.

The situation is often exacerbated by technology-led policies and strategies for implementing e-learning that focus on improving the technical competencies of teachers in HE. Embedding the effective use of ICT and e-learning requires professional development for teachers that enables them to develop a better understanding of (a) learning and teaching in the early twenty-first century and (b) the drivers of students' study practices.

After these underlying factors have been discussed and their relationship explored, consideration will be given to the implications for academic practice and the professional development of HE teachers.

Learning in higher education – what's the problem?

Students have differing conceptions of learning

Entrants to HE have usually spent many years within formal education contexts; they have passed examinations and successfully completed courses. Surely they know what learning involves and have a shared understanding of what it is? Unfortunately, this does not appear to be the case: there are considerable differences in how learners conceive of the process of learning. Interview-based research studies by Säljö (1979) asked student participants to describe what they understood 'learning' to

be. Several distinct *conceptions of learning* emerged from within the many responses elicited; each of these was qualitatively different from the others:

1. Learning as the increase in knowledge

2. Learning as memorisation

3. Learning as the acquisition of facts, procedures, etc. that can be retained and/or utilised in practice

4. Learning as the abstraction of meaning

5. Learning as an interpretive process aimed at the understanding of reality

These conceptions are hierarchical. The first three involve *quantitative* change and assign a largely passive role to the learner, while the fourth and fifth conceptions entail *qualitative* change that necessitates learners being actively engaged in processing information and knowledge.

In practice, students with a passive conception of learning will experience educational activities significantly differently from those with conceptions of learning that demand their active engagement. Passive conceptions of learning might suffice in some educational contexts, though in others they are likely to be inappropriate. Parallels are often drawn between the findings from Säljö's research and the scheme of intellectual development proposed by Perry (1970). That scheme describes a process by which HE students develop during their studies from a holding a view of learning characterised by memorising and reproducing knowledge, to one in which they seek personal meaning by transforming information and ideas to extend and elaborate their personal knowledge and understanding. Students at different stages of the intellectual development had differing expectations of what teaching and learning implied and of their role within the process.

An individual's conception of learning will determine their *expectations* of what should happen in any educational situation and influence the *approach to learning* they

adopt for specific tasks or activities. Significant variations might be found within a cohort of students taking the same course. These are discussed in the following sections.

Students vary in their expectations of learning and teaching

The transition from school to HE can challenge many students' conceptions of teaching and learning. Most new entrants to HE have known only the largely dependent context of full-time schooling and relatively few will have experienced self-managed learning. It is not unusual for new students to discover a dissonance between their expectations of HE and those of their teachers. Many school examinations favour the recall of information and principles that have been memorised and, in order to achieve success, learners often adopt a very instrumental approach to their studies. Kember (2001) found that novice students frequently held a set of beliefs about teaching and learning that could be labelled *didactic/reproductive*. Teaching was seen as the largely didactic process of transmitting knowledge, whilst learning involved absorbing the material defined and presented by the teacher - this relates to the *passive* conceptions identified by Säljö (1979). Kember discovered that

> … students who commence higher education with didactic/reproductive beliefs can find the process difficult and even traumatic. They are uncomfortable with teaching approaches that do not correspond with their model of teachers presenting information to be passively absorbed by students. (p. 217)

Kember found some other students who held a contrasting set of beliefs and expectations about teaching and learning; one that could be labelled as *facilitative/transformative*. Such students expected teaching to be about facilitating learning; they accepted that they were responsible for learning independently with guidance. For these students, learning was not considered a passive process; each

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individual's understanding was achieved through actively transforming ideas, information, etc. for their own particular context and purposes.

Within HE contexts 'learning and teaching' are often taken for granted, but it cannot be assumed that all learners share the same understandings of those terms. There will be students who misunderstand the underlying purpose of educational activities planned by teaching staff. For example, certain students might have difficulties with assignments that ask for more than just the reproduction of material, while discursive tutorials might be incompatible with some students' beliefs about teaching.

Students' expectations and conceptions of learning shape how they approach study tasks

Much research, both qualitative and quantitative, has been undertaken in numerous countries to investigate how students undertake learning tasks (Richardson, 1994). This has developed from studies by Marton and Säljö (2005) that identified qualitatively distinct approaches to learning that result in different levels of understanding. These have been described as *surface* and *deep* approaches to learning. Learners tend to focus their attention either on the text itself (i.e. *surface*) or on what the text is about (i.e. *deep*). The intention underlying surface level processing is memorisation and reproduction. In contrast, the intention of deep level processing is to develop and extend meaning and understanding. Research has demonstrated that the outcomes from studying are related to a student's *conception of learning* and their *approach to study*.

The approach to learning adopted by a student is not an attribute of the individual – it is *relational* – it is their response to the perceived demands of a particular learning task. So, it is not the case that learners are either *surface* or *deep* in their approach to study, although they may tend to adopt one approach more than the other: Their approach is context-dependent. It is how they will be assessed (or *think* that they will

be assessed) on any study task that determines an individual's approach (Laurillard, 1979). A surface approach is adopted if they feel that their factual recall will be tested, or a deep approach if they sense that understanding will need to be demonstrated.

Many e-learning systems include assessment tools that facilitate the construction, administration and scoring of multiple-choice questions and quizzes. Such assessment methods can provide students with speedy feedback about their progress. However, they can easily be overused by teachers, giving students the impression that factual recall is paramount and leading them to employ an approach to study tasks that is inappropriate and ineffective for developing their understanding.

Teaching in higher education – variations in beliefs and practices

The adoption of e-learning in many HE institutions has meant that teachers' practices are more visible, and not only to their students. The ways in which online resources and activities are developed reveals different conceptions of learning and teaching held by teachers in HE. Some appear to be primarily concerned with the potential of ICT for *presentation* of materials and assets, while others seek to exploit the *interaction* or the *dialogue* capabilities. Variations in the pedagogical practices of teachers expose differences in their conceptions and beliefs about the nature of knowledge, learning and teaching. Within a department, faculty or HE institution these might not be overtly acknowledged or discussed among colleagues.

Differences in conceptions of teaching

Research has shown that just as there are significant qualitative differences between students in terms of their conceptions of learning, their expectations of educational processes and their approaches to studying, so too do HE teachers exhibit

corresponding differences in their conceptions of teaching and their approaches to teaching. These variations are not simply a reflection of distinct cultural traditions within academic disciplines, because they might be encountered among teachers working in a single department. These different conceptions of teaching mirror the hierarchy of students' conceptions of learning identified by Säljö (1979). Some view effective teaching as being concerned with bringing about *quantitative* change in students (increasing how much they know about their subject), while others focus on effecting *qualitative* transformations in how learners interpret the world (promoting conceptual change in students and building their knowledge and understanding).

The approach to teaching adopted by HE academics relates to the conceptions of teaching they hold (demonstrated in studies by Kember & Kwan, 2000; Samuelowicz & Bain, 1992 & 2001; Trigwell & Prosser, 1996). If a teacher conceives of the teaching process as primarily being about 'the transmission of knowledge', they are most likely to adopt a teacher-centred approach aimed at imparting what they know to their students. Compare this with a teacher whose conceives of teaching as being about 'the facilitation of learning': such a person is likely to adopt a student-centred approach to teaching, in which the learners are engaged in activities that promote their own conceptions and understanding of a topic. It is quite possible for students to encounter very different approaches to teaching among the academic staff responsible for the particular course or module they are studying.

A further relationship that has been demonstrated is between the *approach to teaching* adopted by HE teachers and the *approach to learning* exhibited by their students (Lindblom-Ylänne, Trigwell, Nevgi & Ashwin, 2006; Trigwell, Prosser & Waterhouse, 1999). In other words, teachers cue their students, directly or indirectly, to *reproduce* that teacher's view of epistemology and pedagogy.

In both the development and the implementation phases, e-learning makes teaching practices explicit and visible. As already mentioned, e-learning in HE has tended to *replicate* or *supplement* existing academic practices, with teachers choosing to use the features that most closely match their beliefs and ways of working. For example, teachers with a *transmissive* approach are more likely to use ICT applications and tools that support the *presentation* of information and student *interaction* with resources and data that the teacher has provided or recommended. The tasks that they set for students tend to reward the acquisition of accurate answers or the application of correct procedures. In contrast, teachers with a *facilitative* approach will attempt to exploit ICT to promote the active engagement of learners and use communication tools that support *dialogue* to promote and develop understanding through discussion and collaboration. The tasks they set for their students are more likely to make full use of *generative* tools to allow learners to demonstrate how their understandings have developed and the appropriate application of their knowledge and skills in novel situations.

Departmental and institutional constraints on teachers' practices

Academics in HE rarely have total autonomy in terms of the way they perform their teaching activities. Social and contextual factors are highly influential, so that the practices *actually* adopted by individual teachers are not solely determined by their own conceptions and beliefs. Teaching practices tend to reflect the departmental and/or institutional environment in which they are conducted and sometimes these vary from the beliefs about teaching held by individual teachers (Norton, Richardson, Hartley, Newstead & Mayes, 2005). Despite rhetoric to the contrary, institutional and departmental contexts often fail to support learner-centred teaching and impose barriers that cause an innovative teacher to revert to teacher-focussed approaches (Hockings, 2005). Changing the teaching practices of individual academics can be

difficult because their preferred approach is mediated by their working environment (Gibbs & Coffey, 2004: Knight & Trowler, 2000).

In many universities and colleges e-learning policies and strategies have been introduced in a top-down manner, with institutional decisions being made about the systems and infrastructure adopted. Academic staff have been encouraged to make use of organisation-wide systems and tools for teaching and administrative purposes. Such models of e-learning adoption introduce additional opportunities for potential dissonance between teachers' beliefs and practices. Individuals might find that they are expected to use tools and applications that have been developed to support a pedagogical model and approach that is not one that they would normally embrace. For example, including opportunities for asynchronous on-line discussion within a course is unlikely to promote co-operative or collaborative working, if the teaching approach is largely transmissive and the only outcomes that are assessed are the work of individual students. Learners will gain little from group work and discussion other than the clarification of uncertain or misunderstood ideas or concepts.

Assessment as the driver of student behaviour

The primacy of assessment requirements is the second major contextual factor that contributes to the disparity between the *anticipated* benefits to be gained from e-learning and the *actual* learning achieved.

Assessment determines the *de facto* curriculum

Students study what is necessary to enable them to complete their assignments and examinations. If courses fail to incorporate e-learning in ways that directly support assessment needs, it is unlikely to be used as anticipated by teachers. This is not a modern phenomenon: over the last 30 years a considerable number of researchers have draw attention to the disparity between what HE students *actually* do when

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studying and what HE teachers *imagine* or *like to think* they are doing. The relationship between students' academic success and their attentiveness to assessment requirements, rather than to the curriculum as a whole, was identified in studies conducted in various HE contexts (e.g. Becker, Geer and Hughes, 1968; Miller and Parlett, 1974; Snyder, 1971). Their findings have been reported in many texts offering guidance for educational practitioners, but there is limited evidence to be found of HE teachers being aware of research into the *teaching* of their discipline. The crucial link between assessment and student learning has been emphasised by many writers (e.g. Boud, 1995; Brown, 1997; Brown & Knight, 1994; Ramsden, 1992; Rowntree, 1987; Watkins, Dahlin & Ekholm, 2005).

For many HE teachers, course assessment is something of an afterthought, unless they teach to an externally determined syllabus. How students will be assessed is only considered after they have determined the content and approach of their teaching. A teacher's assessment practices usually reflect their beliefs about learning and teaching and their teaching approach (Samuelowicz & Bain, 2002). It is very unusual for HE teachers, whether working individually or within a team, to start by planning the assessment, in full knowledge of its influence on what students pay attention to in their studies and on how they go about learning. Gibbs (1999) has drawn attention to the importance of assessment in capturing student time and attention and in generating appropriate student learning activity: "Assessment is the most powerful lever teachers have to influence the way students respond to courses and behave as learners" (p. 41).

Assessment and students' use of technologies for learning

Students concentrate their efforts on those elements or aspects of a course that they know or anticipate will benefit their assignment and examination performance (Scouller, 1998). Learners often apply a form of cost-benefit analysis when deciding

how to go about their studies: Will the *benefits* to be gained from undertaking a task or activity outweigh the *costs* incurred in terms of time, effort, inconvenience, etc.? Optional or enrichment activities and materials tend to be under-utilised if they do not contribute directly to assessment outcomes. As far as e-learning activities are concerned, those aspects that are not perceived by students as being linked to assessment will receive little or no attention.

Large-scale quantitative surveys of UK Open University students indicate that the extent to which learners make use of recommended information and resources from the Web varies considerably between courses (Kirkwood, 2006). Where such resources are supplementary to normal course work, their use by students is minimal, while those that contribute to assessed outcomes get drawn upon to a significantly greater extent. The data suggests that students' use of Web resources is more closely related to the pedagogic design of courses and to assessment requirements, than to the increased availability of information sources and communication opportunities *per se*. Structured interviews with students have helped develop a better understanding of this relationship (Kirkwood, 2008). Courses and modules vary in terms of the teaching approach and pedagogic model adopted and the manner in which e-learning activities are included. When a course has been designed to exploit communication with others learners and/or drawing upon online information resources as necessary features of the learning experience, learners are highly likely to engage actively with activities that support these. Integrated course design of this kind requires the educational rationale to be made explicit, not simply assumed to be self-evident, and the expectations of learners to be managed appropriately.

The literature shows that it is possible for HE teachers to devise many innovative ways to incorporate e-learning activities for their students to undertake. However, if the use of ICT has not been integrated into the structure of the course by

constructively aligning it with the assessment strategy (Biggs, 2003), it is unlikely to be used in the manner intended:

> Again and again learners emphasised the role of the marking scheme in their decision to use ICT resources. Without adequate reward structures, students were unlikely to access online resources or tasks, despite recognising that that they would assist their preparation for the final exam at the end of the semester (Concannon, Flynn & Campbell, 2005, p.509).

Designing e-learning to align with the assessment requirements

A very important task for HE staff is to engender in students an appropriate conception of teaching and learning and to provide an educational rationale for undertaking e-learning activities. For example, if teachers expect learners to co-operate or collaborate with their peers through tasks involving communicative uses of ICT, the purpose of any such discursive activity and the anticipated outcomes must be made explicit. If the intention can be misunderstood in a face-to-face context, why should it be any less problematic when undertaken online?

If we want students to engage with a course to develop their knowledge and understanding rather than to memorise and reproduce facts, the manner in which the course is assessed (through self assessment tests, assignments and examinations) must reflect that purpose. If collaboration and team working are vital aspects of the learning process, the *process* as well as the *product* of shared endeavours should be taken into account (Macdonald, 2003). Assessment items should direct learners to those aspects of a course that are of primary importance because they *are* essential for successfully achieving the learning outcomes.

However, this does not fit well with conventional ways of planning and presenting HE courses. Typically, courses are content-driven rather than the teaching and learning being derived from the educational outcomes that successful students are expected

to achieve or demonstrate. More often plans for HE teaching progress in a manner similar to Teaching Approach A shown in Table 1.

Table 1 About Here

When the learning outcomes determine the content, the pedagogic approach and the assessment that are necessary and appropriate, course planning is undertaken as described in Teaching Approach B in Table 1. Learning outcomes can be conceived in terms of

- the *knowledge and understanding* of the subject matter that learners are expected to demonstrate,

- the *cognitive skills* (e.g. ability to analyse, review, evaluate, etc.) necessary for the intellectual processing of information and data, and

- the *key practical skills* of handling information and communicating with other people.

E-learning activities, whether self-standing or used in a blended context, should facilitate the desired learning outcomes, by providing the means by which important learning experiences can be accomplished. Biggs (2003) has called such a view of course design *constructive alignment*, a fundamental principle of which is that:

> a good teaching system aligns teaching method and assessment to the learning activities stated in the objectives so that all aspects of this system act in accord to support appropriate learning (p. 11).

This learning-centred approach is not advocating the adoption of a mechanistic style of course design: it is not simply about specifying behavioural objectives nor about itemising rigidly defined competencies and narrow or limited outcomes. It is much

more a matter of enabling learners to demonstrate that they have started to think, understand *and act* like an historian, a physicist, an engineer or a health professional. It is about students learning to participate within a 'community of practice' related to their profession or discipline area (Lave and Wenger, 1991).

The role of professional development for HE teachers

Effective use of e-learning in higher education requires a great deal more than (a) the installation of technical systems and infrastructure and (b) training for academic staff to adapt their teaching practice to incorporate e-learning tools and applications. To achieve more successful use of learning technologies in HE, the focus for professional development activities must be much wider than simply improving the technical familiarity and competence of teachers. It is not sufficient that teachers should understand *how to operate* particular items of hardware and/or software. They also need to understand

- *why* students' learning and their effective use of technologies depends upon assessment requirements, and

- *why* teaching and assessment practices must be aligned and be supported by appropriate uses of technology.

This means that academic staff need a grounding in the scholarship of learning and teaching, in order to better appreciate the issues and relationships discussed briefly in the earlier sections of this presentation. The potential benefits to be gained from e-learning – by both learners and teachers – are more likely to be realised when such innovations are not technology-driven, but are directed at achieving sound pedagogical purposes and outcomes.

However, even when professional development programmes focus on development and support of teachers' understanding of teaching and learning issues, academics

are often unable to implement innovative practices due to their departmental and institutional context. No amount of professional development for individual teachers can alter an environment in which they feel unsupported and unrewarded for innovative teaching. The organisational context and environment must have strategies, policies and support structures in place that encourage student-centred learning, where the use of ICT and e-learning is constructively aligned with teaching programmes. If an institution is serious about improving the quality of education for its students through e-learning then it needs to adopt a professional development programme aimed at all academic and academic-related staff working within the institution.

Conclusions

The focus of this article has been on the variance that is often reported between the *potential* and the *actual* impact of e-learning upon learning and teaching in HE. It has been argued that the use of ICT does not, *in itself*, result in improved educational outcomes and ways of working, but that various contextual factors exert greater influence upon what and how students learn. In particular, it is suggested that academics in HE need to re-assess their teaching and assessment practices to better understand the impact they have upon students' experiences of learning. For students, a crucial driver of their study behaviour – including the use they make of e-learning materials and resources – is what they need to do for assessment purposes. Professional development activities that aim to improve HE teachers' technical facility with ICT are less likely to lead to transformations in academic practices than to existing teaching being replicated and supplemented.

The contextual factors discussed here are fundamental to almost all measures aimed at improving teaching and learning in HE generally. As such, they are related in only limited ways with uses of learning technologies *per se*. The significance of e-learning

is that it tends to expose teaching and learning processes to scrutiny and to make visible any contradictions between the aims and goals of learning in HE and the actual teaching, learning and assessment practices taking place within institutions.

There is clearly a need for more research to be undertaken that goes beyond an examination of the potential of e-learning in HE. Future studies would seem to be appropriate in the following areas:

- how applications, tools and systems are *actually* being used by students in their required learning tasks and activities, and how these relate to learners' everyday uses of digital technologies;

- how HE teachers use digital technologies in their everyday lives and how they incorporate ICT use into their academic practices; and

- the nature and extent of barriers to the effective utilisation of e-learning tools by teachers and learners.

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Table 1: Two contrasting sequences of course design for e-learning

Teaching Approach A	*Teaching Approach B*
Determine the content (knowledge, skills, etc.) and how it will be taught – including selection of media	Determine what learners are expected to achieve (knowledge, skills, etc.) from taking course and how that can be demonstrated
Produce teaching materials and resources, exploiting the media available	Design teaching with appropriate media to enable learners to achieve those outcomes
Construct assessment items to test / sample students' understanding	Assess that teaching and learning have been successful