

Assessment 2004: Beyond Intuition
Second Biannual Joint Northumbria / Earli Sig Assessment Conference
University of Bergen: 23 - 25 June 2004

Paper title: A model for e-assessment: building on UK and Norwegian experience in rewarding and motivating the e-learner.

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Conference themes explored in the paper: formative assessment, summative assessment, e-learning and e-assessment

Abstract: This paper will explore the significance of e-assessment as a critical component of e-learning amongst adult, work-based learners, based on the evaluation of practice in both the UK and Norway. It asserts that e-learning can provide learning opportunities independent of particular learning venues and times, and that at its most successful it is able to present complex situations from a number of different perspectives and so foster interest in the subject, encourage flexible thinking and the acquisition of usable knowledge. However, our fieldwork and critical reading suggest that to generate value e-learning requires a shift from an instructional to a constructivist learning paradigm, and to self-directed learning where knowledge is individually constructed within and through the student's own problem-solving processes. Critical to this is the embedding of meaningful formative and summative e-assessment episodes that facilitate and encourage effective learning, and address known issues of learner motivation at the screenface.

The paper presents a model for e-assessment based on trans-national experience and evaluation, designed to capture and employ the powerful learning benefits of effective and timely assessment, and exploit the dialogue-rich potential of the virtual learning environment.

Introduction

Whilst academic assessment is a contested political process its importance for individuals, institutions and national and international systems of education and training is both central and self-evident. Yet amongst the hype and promise associated with the global development of e-learning approaches, the development of meaningful e-assessment is in its infancy. However our experience of e-learning developments both in the UK (<http://www.televersity.ac.uk/covets/>) and Norway (<http://uit.no/uvett/1470/>), and trans-nationally through EU funded collaborative projects (<http://www-deis.cit.ie/BiTE>), suggests that the global development of e-learning necessitates an equally powerful, but currently less mature, development of e-assessment approaches to complement and enrich its value. Indeed, that the location of assessment at the core of the development of e-learning provides a welcome opportunity to move the current e-learning debate beyond that concerned with technology to one that is fundamentally educational.

Recently, a significant literature has emerged exploring the pedagogical issues associated with e-learning (Murphy *et al.*, 2001; Weller, 2002). This has focused primarily on teaching and learning approaches, and content development issues, much of this grounded in a constructivist framework. Assessment has been a missing element in much of this work. However, it is our contention that recognition of the primary role of assessment is crucial to exploring the educational potential of on-line learning, and the re-positioning of the educationalist within the changing interactional learning environment e-learning can facilitate.

The Context of On-Line Assessment

Academic assessment involves judgement and begs important questions about who decides and whose interests are furthered by those decisions. In the context of adult, work-based learners, the functions of assessment can be summarised as:

- attracting learner attention, motivation, time and other personally held resources, and as such encouraging the prioritisation of these resource towards a known and given outcome;
- providing a meaningful context in which learning can occur;
- supporting the demonstrable realisation of specified learning outcomes;
- supporting the informing of judgement and practice so as to promote proactive action;
- providing a formalised and meaningful opportunity for feedback that has an intended impact on subsequent learning. Such feedback can be from self, peers, tutor or some significant other, or through computer assisted testing or similar technological approaches. In this context, assessment becomes a key facilitator of learning and not simply the calibration and communication of 'right' or 'wrong' answers to questions;
- supporting learners to understand and internalise the standards and requirements of study, itself a form of control, and the presentation of learning achieved, both in terms of general academic level and subject specific knowledge, skills, competences and performance capability;
- supporting the generation of data through assessment gradings which support subsequent judgements about academic attainment and the differentiation of learners against formal and informal criteria;
- providing evidence of academic quality at a range of levels including course or programme of study, whole institution, and across and between programmes and institutions.

This list is intended to be indicative rather than comprehensive. Nonetheless, it highlights the critical importance of assessment for a range of stakeholders. For the student, it validates learning both during a programme of study and at its conclusion (i.e. at the point at which learning can be adequately demonstrated for achievement and appropriate accreditation) and offers progression in and to employment and further study. For the academic, assessment provides the mechanism by which student achievement is determined and the achievement of a group of students benchmarked, potentially reducing individuals to ciphers in the educational marketplace. Whilst for the education or training provider organisation, it offers both a means of identifying and rewarding achievement and of maintaining and enhancing control through quality standards, particularly through comparative analysis. These functions interact, and various stakeholders contest, both the primacy and operationalisation of these in practice. So, for example, the standards debate in higher education reflects competing views on the comparative worth of higher education attainment and the legitimacy, or not, of the assessment methods used to judge and accredit such attainment. Another example is the competing economic views regarding the relevance of higher education, particularly in relation to the key skills of undergraduates, and their individual and collective preparedness for employment.

Traditional summative assessment methods focus on the generation of data to support judgements on attainment and to provide evidence of academic quality (however specifically defined). They rely heavily on content recall, most usually in the case of time-constrained examinations, and content and process manipulation, usually in the case of continuous assessment approaches. Whilst formative assessment is an established part of many programmes of study, there remain strong differences of professional judgement regarding the value associated with it. This tends to lead to a diminution of the role of assessment as a learning tool, whether formative or summative. Rather, assessment represents one or more barriers to learner progression. Potentially, an end in itself and not a means to an end.

This traditional approach encourages learner instrumentality and is ultimately antipathetic to notions of lifelong learning. It is however consistent with a concern for comparability of award and the identification of core subject knowledge. This tension reflects the continuing philosophical duality between education as a liberating force, promoting individual ownership of learning, and education as an economic tool, promoting vocational specificity and addressing known barriers to competitiveness. This is not a new tension. Nonetheless, the recognition of these competing approaches offers a foundation for an exploration of the role of e-assessment as a key component of e-learning strategies for adult, work-based learners. In particular, the extent to which e-assessment can support the development of an educational practice that addresses the twin policy aims of lifelong learning and the

promotion of economic competitiveness, whilst establishing and maintaining student motivation at a distance and at the screenface (Funnell, 1999).

The expansion of e-learning initiatives and the growing use of knowledge, content and opinion available through the Internet has resulted in it becoming not only a repository of data but also a commercial arena for the buying and selling of assessment artefacts. These, and other trends such as the growth of mass higher education provision internationally, are stimulating reviews of assessment practice. Some to explore more learner driven forms of assessment based on notions of independent study, others to reinforce and further police standards, for example by establishing enhanced mechanisms to identify plagiarism.

The development of approaches to e-assessment is in its infancy. Yet the global development of e-learning necessitates an equally powerful, but currently less mature, development of e-assessment approaches to complement and enrich its value. Such a move requires that the development of e-learning as a set of educational practices be explicitly associated with the challenging requirement to articulate and facilitate the meeting of transparent educational objectives and learning outcomes. Indeed, it is only once these are negotiated, that the place of e-learning, and other forms of ICT-supported learning, can be meaningfully determined. By focusing on learning and the learner, it becomes possible to move the debate away from the current rhetoric around how educationalists can best employ existing or emerging technologies, to one concerned with learning outcomes, and how best to engage learners in the process of negotiating, determining and managing their own learning using available tools. This approach suggests that there is no inherent value associated with e-learning; rather that its value is a function of its use in any given or known context. It also challenges the powerful techno-entrepreneurialism and associated technological determinism explicit in much further and higher educational policy and practice.

Within this critical approach the potential of e-learning is significant. Whilst much global experimentation has involved traditional campus-based learners using on-line approaches to complement or substitute for more traditional teaching (Ryan *et al.*, 2000), a critical engagement with the views and experiences emerging from projects such as CoVETS and CLIENT (<http://www.client-learning.org/>) and the literature in the field, suggests that e-learning has potential in:

- opening access opportunities for non-traditional learners and those whose access to existing learning opportunities is constrained by time, cost and location;
- promoting learning through situated collaboration;
- promoting incremental lifelong learning facilitated through the maintenance of a learning portfolio;
- work or community based learning, available to address specific skills and competence gaps *in situ* (e.g. the workplace or the shopping centre);
- promoting interdisciplinarity in curriculum design and the assessment of learning. The contention here builds on the work of Barnett (1990) and is that by moving beyond the boundaries of specific disciplines it is possible to promote learning that is both learner-led and empowering whilst developing individual capability and an informed cosmopolitanism, the capacity to live ethically in both the local and the global;
- developing the capability of individuals and organisations to function in an age of supercomplexity (Barnett, 2000).

Recognition of supercomplexity creates significant new operational, cognitive and pedagogical agendas education and training providers, elements of which can be addressed through innovative engagement with e-learning and e-assessment.

Addressing the demands of these new groups of learners will be both challenging and novel. It is unlikely that traditional patterns of teaching shaped for on-line consumption will provide the specific and timely access to content and dialogue required. The articulated requirement for assessment on demand, 'bite sized learning chunks' and 'anytime, anywhere learning', represent a major paradigm shift.

Establishing an On-Line Pedagogy for adult, work-based learners

The articulation of an on-line pedagogy for adult, work-based learners requires the drawing together of theory and practice. Our starting point is to acknowledge the constructivist notion that knowledge and understanding cannot be conveyed in a physical sense from one person to another, rather that the individual constructs new knowledge and understandings in interaction with the world. As such, deep learning results from individual and collective engagement with a topic or context requiring motivation and effort. As such an on-line pedagogy for adult, work-based learners must place the learner at the centre of the learning process, as an active participant both in the act of study and the design of legitimate and assessable learning. Such learning must be situated and authentic, recognising the life experience and aspirations of the learner, and the communities of practice she/he engages with now, or wishes to in the future (Wenger, 1998). On-line learning environments can then be designed to facilitate the learner to participate in activity and associated assessment, singly or as part of a collective, in ways that are personally meaningful and effective.

Following Fowler and Mayes (1997; 1999), incremental stages of learning and associated on-line 'courseware' may be identified to support this process:

- 'conceptualization' (learning through engagement with other peoples' views and concepts, so building knowledge and understanding) supported by primary courseware such as text, multimedia products and simulations;
- 'construction' (learning by doing, including the testing of one's own knowledge and understanding) supported by on-line learning contracts and Internet brokerage tools to support independent study;
- 'identification' (understanding ones own conceptualization sufficiently well to engage in dialogue with others in the subject or areas of study) supported by courseware that promotes critical dialogue, the products of which may in turn be captured and re-employed as reusable learning objects or significant learning episodes.

Central to this is dialogue:

"Dialogue provides the vehicle for conceptual movement. It facilitates the transition between stages and the advance from one reconceptualization cycle to the next... [it is] integral to the whole cycle" (Fowler and Mayes, 1999:10).

Indeed, it is through dialogue that a key opportunity for teaching occurs, where the student's focus of study can be directed, misunderstandings addressed, questions answered and new questions posed (all potentially recorded and stored for future use); where the development of the capabilities and competences for independent learning can be supported. Building on this, and the work of theorists such as Kolb (1984) and Vygotsky (1986), dialogue may also be identified as the mechanism for establishing effective learning relationships, for scaffolding learning and engaging in new forms of on-line assessment.

Learning Relationships and e-assessment

Fowler and Mayes (1999) identify three broad types of learning relationships: explorative, formative and comparative:

- 'explorative' learning relationships involve the discovery of other people's concepts and practice boundaries. This is identified as a descriptive process discovering the 'what' rather than the 'why'. The relationship between the learner and others is asymmetrical, with the majority of information flowing to the learner from others in ways similar to didactic teaching;
- 'formative' learning relationships focus on building understanding through guided activity, and establishing and testing hypotheses about the world and the nature of practice. The relationship between the learner and others is symmetrical, with the learner's contribution matched by feedback following the assessment of performance;
- 'comparative' learning relationships presuppose the learner has some level of expertise or standing in a practice community. Such relationships allow the learner to identify their knowledge and understanding with others, or align their practice

with the practice community. The relationship between the learner and others is asymmetrical, with the majority of information flowing from the learner designed to support the maintenance and development of knowledge, understanding or practice.

Within such relationships, Fowler and Mayes identify that those supporting learners (so-called 'support agents'):

"...must be a knowledge resource, able to sustain a dialogue with the learner, and able to guide and support the learning tasks. These are the characteristics which have previously been used to specify the requirements for an intelligent tutoring system... A crucial issue to address is the extent to which the characteristics of an agent in a learning relationship can be provided through technology. This is a fundamental question about the role of learning technology, under which most of the design issues for computer-based learning environments can be subsumed. What aspects of effective learning support absolutely require a human relationship?" (1999:13).

Our contention is that the development of appropriate learning relationships with and amongst adult, work-based learners rarely requires extensive direct face-to-face engagement. Rather, by focusing design on explicit and negotiated learning outcomes, and the creation of purposeful assessment episodes, the dialogue potential of e-learning can support meaningful learning in virtual contexts. In such contexts, assessment in both its formative and summative forms becomes critical in encouraging and maintaining learner motivation, whilst acknowledging learner instrumentality. Effective assessment episodes provide opportunities for the presentation of evidence to support the realisation of learning outcomes articulated at one of the three stages of learning identified by Fowler and Mayes: conceptualisation, construction and identification. Dialogue underpins such assessment in terms of educational principle and reporting methodology. Effectively managed dialogue can promote deep learning, learner empowerment and foster a commitment to lifelong learning. On-line approaches support new dialogue opportunities which are both synchronous and asynchronous, and which can support students to engage with one or more on-line communities. However, the realisation of this potential requires an approach to assessment that fully engages the individual, requires the sharing of learning and its testing in peer and other fora, welcomes and rewards experimentation, and supports a continuous processes for recognising, recording and celebrating achievement. So, for example, traditional essay approaches (with their inherent residual fear of plagiarism) give way to the explicit identification, manipulation and re-presentation of on-line texts in support of an argument or theoretical proposition. Traditional time constrained examinations are replaced by the presentation of a portfolio or log charting a learning journey, through for example the 'book marking' and manipulation of Web resources, supported by on-line tests and telephone or *voice-over IP* discussion. As such, assessment becomes a continuous and embedded aspect of the learning programme not an adjunct to it, and is presented and managed on-line. It becomes integral to e-learning as it:

- encourages and maintains student motivation;
- offers a rationale for dialogue and the sharing of learning with peers and the world;
- supports the incremental, partial and contextualised development of learning;
- acts as the custodian of quality and standards, including access to a practice community.

In curriculum design terms, assessment becomes the determinant of the learning programme itself.

A Model of e-assessment

An institutionalised model of e-assessment needs to be dynamic and capable of addressing the different requirements of stakeholders. The following model (Figure 1) seeks to achieve this by placing the design of assessment before that of the learning programme. This is to:

- ensure that there is a clear link between articulated learning outcomes and the assessment regime introduced;
- ensure that the subsequent learning programme is designed to assist students address the requirements of assessment episodes, so facilitating learning which contributes to meeting learning outcomes and supporting accreditation;
- provide a feedback loop between learner achievement, the creation of assessment regimes and the design of learning outcomes.

Figure 1 acknowledges that in any learning context, assessment, whether by self, peers, tutors or significant others, has an important role in encouraging and maintaining motivation, ensuring equivalence of learning across and between individuals, and supporting the formation of judgement and practice so as to promote positive action in the world. Given the potential isolation of on-line learners, this motivational stimulus takes on increased importance both as a means of encouraging success in a given learning interaction and in promoting lifelong learning. It also associates the development of a new on-line pedagogy with the role of assessment in mediating between professionally accredited learning outcomes and the learning programme (which may itself be designed by the learner). This seeks to capture and employ the powerful learning benefits of effective and timely assessment, and exploit the dialogue-rich potential of the on-line learning environment.

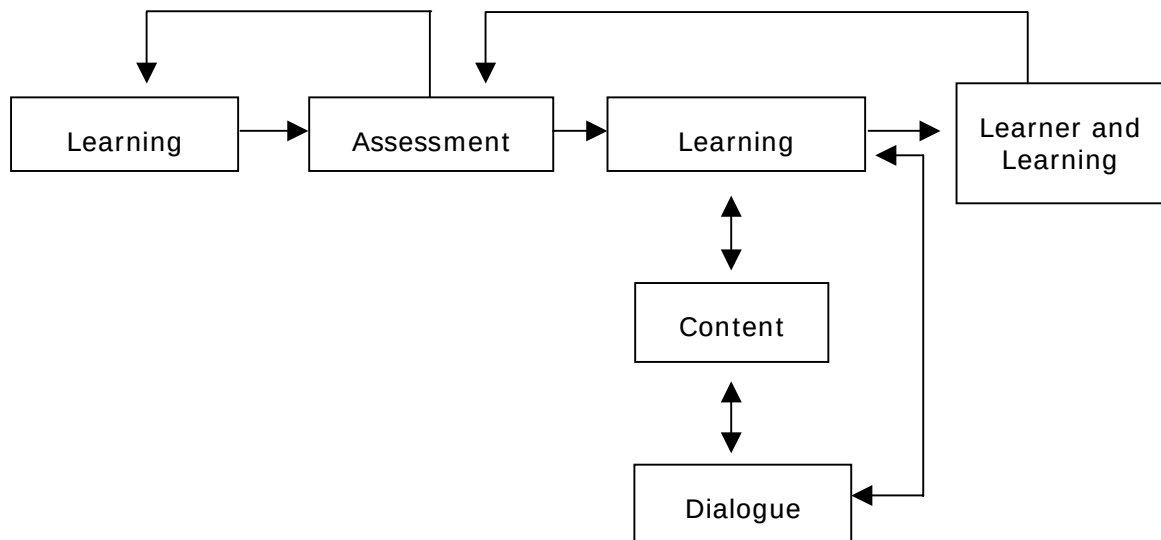


Figure 1: Institutional model of e-assessment

The model seeks to dynamically represent the stages of a process of e-assessment within an institutionalised context, specifically:

- the professional articulation of learning outcomes based on relevant benchmarks/standards and informed by the learning needs, interests and aspirations of individual learners;
- that learning outcomes are reflected in assessment methods and intentions;
- the preparation of learners to support assessment targets is reflected in the design and delivery of learning/facilitation programmes and the selection/brokering/design of relevant content;
- that learning and facilitation programmes are designed to support learning;
- that learning is monitored through formative assessment and the dialogue associated with such assessment;
- that learning and achievement against learning outcomes is accredited through summative assessment;

- the professional evaluation of learner achievement supports review and rearticulation of learning outcomes and learning aspirations, so supporting lifelong learning.

The development of e-assessment is in its infancy. Developmental issues are complex and multi-dimensional. Nonetheless, it remains key to unlocking the educational value of e-learning approaches. As such, the wider implications of the model are significant in terms of:

- curriculum design and course validation;
- a search for new forms and methods of formative and summative assessment and the design of on-line assessment episodes which maximise dialogue opportunities, for example through structured on-line groupwork and the creation of on-line learning logs;
- the role of significant others in the learning and assessment processes - peers, family, work colleagues, employers; and the establishment of new educational roles such as that of generic on-line learning advisor;
- the induction of learners into new learning environments;
- resource decisions of education and training providers, including decisions regarding the support of learners through the new virtual architecture of on-line learning;
- quality assurance policy and practice and associated audit mechanisms;
- further research into the dynamics of teaching and learning, and in particular evaluative studies into the requirement for face-to-face contact to support tutor responsiveness and the success of learning interactions;
- a challenging re-defined role for the tutor, from the primary source of knowledge to that of architect of relevant, explicit and transparent learning outcomes, guide and broker of relevant on-line content and summative assessor.

Again, this list is not intended to be comprehensive, nor does it seek to assess the current or predicted sophistication of global technologies to effectively support individualised approaches to learning. It does however give an indication of the revolution in educational thinking that is required to underpin the further establishment of on-line learning and assessment, and its potential impact on professional practice.

Redefining Professional Practice

The expansion of e-learning approaches in adult, work-based learning has significant implications for professional practice. It has generated both resistance strategies and calls for the active engagement of educationalists in the development and embedding of the new media (Inglis *et al.*, 1999; Laurillard, 2002). In exploring the recent history of innovations in teaching and learning in higher education, Hannan *et al.* (1999) concluded that the period can be typified by “directed innovation” driven by institutional imperatives, including the maximising of returns on investment in new technologies and promoting learner-centred learning for efficiency reasons. These challenge and contest with established perceptions of student learning and professional practice, and generate professional resistance or inertia, although this is by no means uniform within or across organisations. Exploring this theme, Ryan *et al.* (2000) identify the following “downsides” associated with the introduction of what they term ‘Internet and resource-based learning’:

“Teaching staff may be:

- reluctant to give up their autonomy *vis-à-vis* teaching content and forms of delivery;
- reluctant to accept, without strong evidence and/or personal experience, that new methods and materials are effective;
- anxious about adopting teaching methods and materials that are much more open to peer examination and appraisal;
- anxious about having to work in teams;
- anxious about engaging in less formal, dialogical encounters with students;
- reluctant to acquire new... skills” (2000:159).

The development of e-learning in this context requires a positive recognition of, and active engagement with, this professional discourse and a search for models of professional

practice, and continuous professional development, which might address issues and concerns, recognising the differential power relationships and dynamics that underpin the formal processes of, and organisational structures which provide, education and training. As such, acknowledging that any proposal to redefine professional practice is a political statement, and that change itself may lead to intended and unintended consequences.

Daniels (1996), Inglis *et al.* (1999) and Laurillard (2002) identify the importance of professional development to support teaching staff adjust, develop and exploit the educative potential of e-learning. However, our experience suggests that new models of learner support are required to realise the perceived benefits associated with e-learning. Building on this, and the work of Salmon (2000) and Collis and Moonen (2001), we propose that an element of the redefined professional practice associated with e-learning is an operational requirement for an extension of the established tutor-learner dialectic by adding an explicit and embedded relationship and dynamic between the tutor, learner and a learner advisor. This is presented diagrammatically as a model as *Figure 2*.

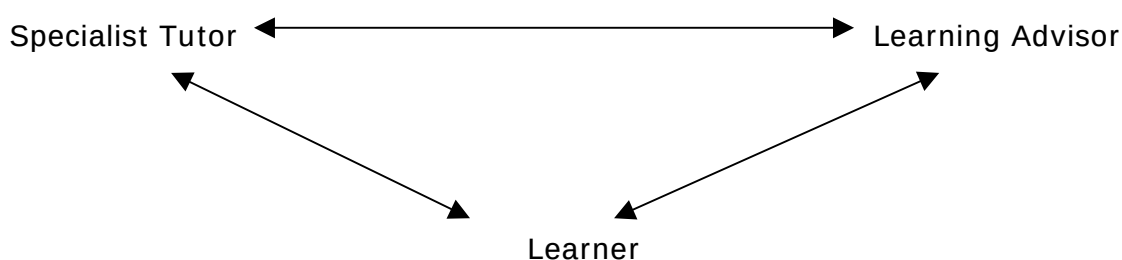


Figure 2: Learning Advisor in a Revised Teaching and Learning Model

A key element of this model is that it divides the roles associated with course construction and subject knowledge from those of learning process facilitation, the promotion of dialogue and administration. Reflection on experience leads us to suggest that the role of the learning advisor could be extended to include:

- maintaining effective dialogue through the management of on-line interactions and the establishment of standards, etiquettes and procedures that empower participation and avoid the tyranny of the vociferous;
- promoting high expectations on students and tutors and a strong commitment to realising established learning outcomes;
- encouraging interaction, whether through questions, exercises, evaluation or feedback, ensuring a balance between control and autonomy for students;
- maintaining effective and respectful working relationships between parties;
- being available to support learning asynchronously in line with transparent service levels, such as timescales for responding to e-mail correspondence;
- an observational role, monitoring learning achieved, and a proactive championing and mediating between the student and the tutor;
- acting as a broker between the student and the available technical support system, so addressing the debilitating effect of embarrassment on the student and encouraging the take-up of support and assistance.

This role has many of the characteristics and qualities of *e-moderating* promoted by Salmon (2000:40). Importantly, it also maintains the distinction between subject expertise and the routine and proactive facilitation of learning through focused dialogue required to maintain learner motivation. The educational rationale for this being embedded in a constructivist notion that learners will construct legitimate learning assuming appropriate support and scaffolding structures are in place, that access to elements of on-line learning content is brokered, and assessment tasks are perceived by the learner to be legitimate and purposeful. In a world characterised by supercomplexity, it is the personal competences of flexibility and adaptability, critical thinking, communications, self-management and social and cultural awareness that are prized. These cannot be taught, they can only be learnt. To encourage such learning in on-line contexts will require active support as much as subject mastery. Differentiating the roles of subject (content)

specialist and learning adviser supports a focus on the process of learning alongside the identification and articulation of legitimate knowledge. This potentially liberates the subject specialist to engage in relevant research, learning content creation, brokerage and reuse (at both high levels of granularity and as coherent learning programmes), and course and assessment design and management - essentially reprofessionalising the role - whilst focusing the learning advisor on actions to support and motivate the learner. It is also consistent with the trend towards publicly available digital academic content (see, for example, <http://www.jisc.ac.uk/>, <http://www.ltsn.ac.uk/>, <http://www.ferl.org.uk/>), and the borderless plasticity of the Internet. However, this division between the construction and legitimisation of learning content and the proactive support of learning is a contested area. Certainly it challenges the relative autonomy of the academic, and any 'taken for granted' link between subject knowledge and the ability to encourage and facilitate others to learn. However, in so doing it acknowledges the "irony" of taking a learner-centred perspective on these new on-line learning opportunities identified by Alexander and Boud, namely that it:

"...focuses us strongly on what the teacher/educational designer needs to do to maximize students' learning from experience. This focus on what the teacher is doing to enable learning may be seen to be contrary to the current rhetoric surrounding student-centred learning, which focuses on what students do to the exclusion of what the teacher is doing. There is a vital role for pedagogy that is in danger of being neglected in the rush to make all things possible in the open environment of the Internet" (2001:14).

Our approach seeks to avoid this danger of neglect, and promote the recognition of the key role of educationalists in the discourse on the value of e-learning.

Conclusion

This paper has outlined a model for adult e-learning and explored the implications of the model for e-assessment and professional practice. The implications of e-learning go further and inform, and are informed by, the governance and management of provider organisations, quality assurance and resourcing issues. An exploration of these goes beyond the scope of this paper. However, acknowledging this limitation there remains evidence to suggest that e-learning offers the promise of new opportunities for new groups of adult learners if effectively employed. There is also evidence from our experience and in the literature to suggest that engagement with e-learning generates value defined in terms of the extent to which the student judges that they have been supported, enthused, encouraged, motivated to learn, and taken ownership of that learning, as such to move from passive recipient of teaching to active agent of learning. The challenge for professional practice is to move beyond the marketing hype and techno-entrepreneurialism associated with ICT so as to further articulate and explore new approaches to facilitating learning using the new potentials available within the on-line environment.

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