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CREATING AND SUSTAINING QUALITY E-LEARNING ENVIRONMENTS OF ENDURING VALUE FOR TEACHERS AND LEARNERS

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Abstract

Australian universities continue staking a claim on the future of e-learning, acquiring Learning Management Systems (LMS) as rapidly as universities overseas. Much is published on processes and criteria for selecting the best LMS for an organisation's needs and attempts to establish training and support mechanisms for deploying these systems. Beyond initial efforts to commission these technologies, particularly in the hands of teachers and students, what should happen to ensure these commitments yield real educational value in the long term? The search for and realisation of systemic and substantial new value requires a more profound reconceptualisation of what it means to design and work within contemporary learning environments, incorporating e-learning, in support of excellence in educational outcomes. This demands the foregrounding of the role of the academic teacher in the system in relation to other parties who can make important educational contributions in support of student learning. Central to new strategies is a transformation of the role of academic teacher, but on terms understood by them and supportive of their educational values. Six areas of value creation for teachers and learners are considered in relation to this transformation.

Keywords

e-learning, learning management systems, sustainability, quality teaching

Introduction

We have well and truly entered the era of big institution-wide technology developments driven by strategic competitive advantage, legal, cost and educational considerations. The Federal Government through the recently completed review of higher education in Australia provided its perspective on the challenges of enhancing teaching and learning system-wide:

Mass higher education means a different sort of higher education system, with different parameters and expectations for students, academics and the community. It requires rethinking the design of learning experiences and courses, teacher-student contact, and the role of the academic. It necessitates re-examining the way courses are delivered, the implications of institutional policies and practices and recognising that systems of support for learning are as important as the delivery of subjects and courses (Issues Paper, Striving for quality: learning, teaching and scholarship, *Higher Education at the Crossroads: A Review of Australian Higher Education*, 2002, p.5).

Debates about the desired futures for e-learning are taking place internationally across all sectors and all levels of education (see UK developments, Towards a Unified e-Learning Strategy, Consultation Document 2003). The focus of this paper, however, is on enterprise-based or corporate e-learning developments at the systems-level of the organisation. We acknowledge though that institutional systems-

level developments are located within much broader multi-sectoral and international systems' dynamics. We work in a large, multi-campus, multi-modal institution operating on a great and increasingly large scale, with, for example, a significant number of undergraduate courses with 1000 or more students offered to up to 10 different identifiable student cohorts, across campuses in three different cities in the State of Victoria, off-campus nationally and internationally. There has been a scaling up of the size of all aspects of the contemporary educational enterprise, notably the corporate or 'enterprise-wide' technologies which are perceived to be needed to develop and sustain the new types of teaching and learning environments. Our aim is to reflect critically on current developments, stepping back from significant implementation activity, in order to examine the changing roles of the academic teacher and other important institutional stakeholders in higher education, and to more clearly identify areas where the new corporate technology agenda might productively make its mark in creating and sustaining quality e-learning environments of enduring value for teachers and learners. While acknowledging the legitimacy of other parties' interests in this endeavor we argue that much of the ultimate success of the new technology developments will depend on exploiting six more fundamental areas of educational value for teachers and their learners in e-learning environments.

The six areas (examined in the final section) are: (1) broadened and direct contributions to learning environments from institutional stakeholders already involved in learning support; (2) automated customisation and personalisation of learning experiences for diverse student cohorts enrolled in large, multi-modal courses; (3) an opening up of learning environments to diverse external participants able to add targeted value to learner experiences; (4) development of e-learning environments organically responsive to teaching and learning needs and opportunities; (5) a sharing of learning resources within and between courses created, acquired and accessed by the institution; and (6) development of virtual practica supportive of grounded professional learning that motivates and engages students.

These areas are examined as the foundations of an agenda to yield enduring value for teaching staff, thus increasing the sustainability of corporate-level e-learning systems.

Background

Holt et al. (2001) observed the increasing trend toward the adoption of institution-wide teaching/learning technologies and the various stakeholder interests in these developments. The processes leading to the adoption and deployment of, for example, a corporate learning management system has been well reported for our own University by Smissen and Sims (2002) and accompanying website (http://www.deakin.edu.au/lms_evaluation/old/). Moreover, our own institution is currently determining the acquisition of a Digital Object Management system (DOMS) and may soon move to acquire integrated audio and video streaming capabilities. Along with the implementation of corporate gateway and portal technologies, we see more general trends toward suites of integrated teaching, learning and administrative technology systems occurring throughout higher education. The era of large-scale corporate approaches to supporting teaching, learning and research online has well and truly arrived. These technologies are now supplanting much local educational technology development and implementation which occurred through the 1990s, (e.g. multi-media CD-ROM resources, course websites) an era characterised by the rapid take-up of technology opportunities enacted in multiple grassroots' contexts. The age of local thinking and action (by unit team, course, school and faculty) has it would seem now given way to more strategic institution-wide approaches strongly shaped by senior management competitive advantage, quality assurance and efficiency concerns.

With this flurry of corporate-level activity, have come institutional commitments to ensure in a more coordinated fashion staff and student IT technical competence and capability in using the new raft of technologies in ways supportive of cost-effective online teaching and learning. A number of papers from the 2002 ASCILITE conference in New Zealand attest to the efforts of central academic support agencies to deliver a range of opportunities for the professional development of capabilities required to use the features of the new systems with desired effects (see Collom et al., 2002; Donald et al., 2002; Felton & Evans 2002; Kemelfield 2002; Weaver et al., 2002). These new forms of staff development have been the centre-piece. These new forms of staff development have been the centre-piece of institutions' efforts to

transform themselves for competitive advantage in the new e-learning marketplaces of higher education (see Taylor, 2003). Moreover, along with staff training and professional development, there has been a need to promote the possibilities of the new whole-of-organisation approaches in the form of virtual and online campuses, international alliances for e-learning etc. The impulses for these strategic developments have perhaps not changed over a decade or more. However, the expression of these competitive, strategic motivations are now most definitely associated with the new corporate teaching/learning systems agenda.

New forms of technological and pedagogical disjunction?

We are both excited and respectful of the great efforts we see in the work being undertaken to in a sense get this new corporate technology agenda up and running. Its timing coincides with the increasing robustness of various LMS, DOMS, audio and video streaming technologies that constitute the new corporate infrastructure. On the other hand, we have a nagging feeling that with so much focus and activity around the establishment of the corporate infrastructure that some deeper educational concerns find themselves sitting to one side. By this we do not mean that those involved in training staff and, indeed, students in the use of the various functions of the various technologies are not concerned about educational benefits. They clearly are. What we are concerned about is that in taking the educational technology agenda apart in order to marshal its constituent technological components, the greater picture of educational benefit and impact becomes somewhat obscured for those caught up in the hectic day-to-day work of implementation, and for those constituencies who stand to benefit the most from these developments - academic teaching staff and their students. Holt and Thompson (1995) reported on the technology imperative confronting open and distance education institutions in the mid-90s. We now confront a new type of corporate technology imperative nearly a decade on, one which holds great possibilities but also potential problems if not properly mobilised for well articulated pedagogical ends. For now we see possible technology and pedagogical disjunctions emerging the sources of which can be:

- (a) different parties involved in determining the requirements of different technology systems, with different interests in the different systems spanning legal, commercial, cost and educational considerations;
- (b) parties become pre-occupied with different aspects of the selection of any one system;
- (c) parties are not necessarily clear about how the deployment of different corporate technologies might benefit teachers and learners on the ground involved in different disciplines and professional areas of study at different levels and in different contexts;
- (d) lessons learnt and effective practices developed through previous local technologies may be lost with the changed focus on new corporate approaches and products;
- (e) focus on integration of components of virtual learning environments might not take account of broader integrations with physical learning environments on-campus, in the workplace and at home;
- (f) still less than perfectly reliable, maturing corporate products counter-productively demanding organisational attention toward technical improvement over educational usage, and unintentionally increasing time burdens on teaching staff and students in the short term;
- (g) difficulty of securing the active involvement of all possible constituencies who may be impacted by the adoption of the proposed technologies.

The sources of possible disjunction relate to the complexities of managing and leading such a large and multi-faceted change agenda where various parties have legitimate but possibly only *partial views* on the technologies, their functions, areas of integration and educational benefits to those who will be the major users. One particularly problematic area relates to expectations surrounding the need for systems' efficiencies. The differences between delivering 'content' and facilitating 'learning' needs emphasis, particularly during a period of accelerating interest in content management systems and re-usable media objects. System efficiencies, such as 're-usability' and the 'division of labour' are important in scaling up the education enterprise to create new types of teaching and learning environments of enduring value. However any perception by academics of a 'muscling in', 'crowding out' or a 'putting to one side' of *genuine teacher agency*, will increase system entropy in universities. Already, the integrated and complex nature of the expert role of the academic teacher, is claimed to be threatened with a 'pulling apart' and a loss of academic authority. Legitimate stakeholders in the educational enterprise who are reorganising to deal with 'education' under different policies, funding and technologies, are accused of

grabbing for power and control, rather than fortifying (enriching) teaching agency. While the assertion deserves our attention, we should be working to foreground the integrated role of the academic teacher, supported and in concert with other systemic *educational influences*. We should be working for the fusion of teaching with new capabilities derived from new organisational systems (including, but not limited to technologies), not the deconstruction of the teaching profession, with the attendant growth in ‘partial views’ of the education imperatives and corporate level system agendas: these are unfortunate and naïve views of individual technologies and expert roles, such as (but not limited to) the role of the university teacher.

There are dangers that the vast majority of the active users (i.e. teaching staff and students) are separated in the process from the developers, acquirers and implementers of the new corporate infrastructure. Teachers and learners can become confused with the bewildering array of new technology deployments. Perceived complexity then becomes the enemy of mass adoption beyond minimum determined standards of practice of being online. Moreover, the nature of universities is such that they are highly departmentalised around the teaching and research of disciplines which in turn leads to dispersed centers of thinking and action. This may cause compartmentalisation and fragmentation of activity which is at odds with institutional technology developments premised on more uniform and consistent actions. The local can indeed be undermining of the central strategic agenda, unless central technology directions are reconciled with the multiplicity of local educational philosophies and practices.

Questions that arise time and time again when such centrally orchestrated developments are put to academic teaching staff are: How will these developments benefit me beyond those yielded by previous local technology developments? How does the ‘technology’ align itself with my central curricular and pedagogical concerns? How do I have to work with my colleagues and other key support groups to achieve some of the purported benefits? And, what will these new virtual learning environments look like and how will I work within them to enhance my students’ learning? At the most basic level, one could argue that teachers are keen to push the question of what’s in this new corporate technology environment for me? In the age of quality assurance and continuous quality improvement, as shaped by the Australian Universities Quality Agency (AUQA) and its processes of auditing Australian universities around QA concerns, we believe that the responses to these questions will constitute *the real ‘quality’ action agenda*, and be the hallmark of the new knowledge-intensive, digitally-based learning organisation. It will rest on our ability to discern enduring value in the new learning environments for teachers and learners, and knowing how to create and sustain the things of value.

We note that concerns about what these developments might mean from the perspective of teaching staff have been taken up elsewhere. For example, Weller et al. (2003; p.1) note in relation to the development and use of digital learning objects that, ‘There is very little available practice-based advice on what it actually means for an educator to work with learning objects and how this affects the type of education material they produce’. In taking up these broader concerns, we have attempted elsewhere to outline a framework for the design of contemporary learning environments for excellence in professional education underpinned by appropriate educational principles and illustrated through learning environments characterised by the integration of physical and virtual dimensions (Segrave & Holt, 2003). These ideas are further developed in this paper through the identification of areas where more fundamental enduring teaching and learning value might be achieved. These value creation areas must be based on the realities of the changing role of the academic teacher in higher education.

The changing role of the educator in higher education

Preserving teacher agency in e-learning

In response to the vision of creating more broadly conceived contemporary e-learning environments in higher education (Segrave & Holt, 2003), the task has become the responsibility of a multitude of independent ‘specialists’ ranging from IT managers, education developers skilled in the use of learning systems, librarians and other central service providers. But in the recent flurry to gain a competitive edge, universities appear to be diminishing teacher agency. Kimber et al. (2002; p.152) advise:

Fundamentally, techno-reluctant staff need reassurance that working in a computer-mediated

classroom makes them neither obsolete nor powerless. . . . Teacher definition is not diminished although considerable knowledge and creativity are required in the new role as facilitator of learning. Re-emphasising the teacher role as central to creating the learning environment - through designing rich tasks capable of facilitating higher order thinking and learning - could help recover the teacher's sense of agency.

Evident is a concern to reassure about a *claimed* 'new' role - facilitator, but the literature has long referred to teacher agency in such terms. The concept of teacher as 'content delivery channel' persists in some quarters. Clearly, in the context of tertiary academics without 'teaching' qualifications and novice academics with little teaching experience, the nature, practice and value of specifically the role of 'teacher' comes into question. Frequently academic staff are targets for criticism about a low engagement with information and communication technologies for teaching, but of more concern is any criticism of poor practices in the sphere of institutional policies relating to attributes of excellent teaching (see, for example, Deakin University Policy: Attributes of Excellent Teaching 2002). While academic staff roles are changing along with others in new organisational structures and cultures, there is an acute need to differentiate *teacher agency* from other valid education agents providing varied and broader inputs to students' learning experiences - the multiple stakeholders in and outside the physical university bounds, who actively (sometimes virtually) participate as 'educators' influencing student learning in the comprehensively conceived physical and virtual learning environments. We may vigorously challenge acts to 'pull apart' autonomous academic work, however a substantial shift in power during the nineties has already begun a process of de-coupling duties in the role, evident in the nature of ongoing enterprise bargaining agreements and embedded in the pressing discussions about academic workloads.

From the standpoint of organisational theory and organisational behaviour, the systems in tertiary education institutions could be analysed for business process re-engineering, or functional job analyses could be conducted to ultimately redefine the positions and roles of all contributors to the educational enterprise. The responsibilities of academic staff could be examined for their value-adding beyond the classic domains of 'research and publication', 'consultancy', 'teaching', 'administration', and service to a profession and community. The roles, duties and tasks of the tertiary teacher could be subjected to workload and value analyses, one purpose of which might be to identify the customer values in relation to students' experience of quality teaching. This thought is not conveyed lightly! Back in 1998 Noble reported, 'Educom President Roger Heterich observed. "The potential to remove the human mediation in some areas and replace it with automation - smart, computer-based, network-based systems - is tremendous. It's gotta happen."

Higher education as a system is relatively new and contrary to popular commentary, the *tools of culture* (Salomon, 1993), a society's 'know-how' expressed in its technologies, have inevitably and variously made their way into the classroom. But what have been the impacts? What has not changed? What is it about teaching that we think must be transformed in the face of contemporary tools of culture? Is there really a comparison to be made between the terms 'traditional teaching' and 'contemporary teaching', or simply a continuum between poor teaching and excellent teaching, regardless of the technologies employed? Epistemologies such as 'constructivism', learning theories such as 'situated learning' and teaching strategies such as online 'role-playing' may reflect contemporary notions of education in some fields, but there is no single teaching approach universally applicable across disciplines and educational contexts.

When we talk about the potentials of transforming higher education through the embrace of ICT, what exactly are we trying to convey and achieve in the wake of all things digital and a supposed explosion of 'e-learning'?

Concepts like "hours" of training, "courses", and "online curricula" are out of sync with mobile learning and performance improvement. They are taking the worst problems of classrooms and schooling and imposing them on a new system that does not have the constraints of time, fixed project time frames and personnel, top-down information, and certification requirements. These traditional mind-sets follow an antiquated university model and are too slow, rigid, and expensive for most situations (Gayeski, 2002, p. 168).

University transformation seems to be a constant cry, but as more stake a claim to influence the learning environment, do they share the same concepts when referring to learning and educational pursuits? And what assumptions underscore their intentions to transform teaching? What exactly are the relationships, for example, between Gayeski's corporate employee 'performance improvement' and a true education for the professions? Is higher education distinctive from other forms of education, and what of the *teacherly* roles of academics employed to *educate*? Teachers face enormous personal and professional challenges when confronted by concepts inherent in phrases such as: 'The Learning Organisation', 'A knowledge Society', 'Distributed Learning', 'Learning Management Systems' and 'Life-long Learning'. These terms call into question the centrality and criticality of role of the teacher in all educational settings, certainly in all levels of the formal education system.

In the context of new learning technologies, new theories of learning and teaching, and advocacy for life-long learning, all teachers rightly face calls for role transformations. More than at any other time in history, the *tools and artefacts of culture* are determining information processing and communication, and dramatically challenging the processes and practices of teaching and learning. Education literature is awash with references to constructivistic learning environments that support principles associated with 'active learning', 'reflective practice' and 'collaborative learning', for example. Authors highlight the need for 'authentic', 'situated' settings that are 'meaningful' and stimulate learner 'engagement' and 'interaction'. Designers working with new technologies to produce technology enhanced learning, teaching tools and environments, are pushing the frontiers, but what are the teachers *doing*?

Horton (in Islam 2002) suggests, 'E-learning doesn't change anything about how human beings learn.' This was partly supported by the findings of Russell (2001) where, 'Simply put, there is good teaching and bad teaching and it has nothing to do with the technology'. And yet there are counter claims that technology is not neutral (Merrill, 1992; McLuhan, 1967). By variously empowering learners through technology and richly resourced, constructivistic learning environments, and/or prescribing and automating teaching through captured pedagogical patterns and expert systems, there remains a challenge to the role of the teacher. Regardless of these inconclusive positions on technology, teachers need to be aware of encroachments of technology, and very clear about teachers' *primary value in the learning relationships of their students*. Further, they need to acknowledge and maximise the value of a multitude of contributions from other stakeholders in contemporary educational environments.

Situating transformation through commitments to enhancing teacherly knowledge

'Education' is an abstract concept - from the Greek 'to lead out', and it clearly takes a multitude of forms. The most you can hope to *consistently* witness in educative events is at least one student 'learning' and one or more other parties either directly or indirectly responsible for 'making student learning possible' (Ramsden, 1992). Education requires interaction with the environment in a manner that provides human feedback about the meaning of the resultant change in the student (Laurillard, 1993).

Ask a friend about their past teachers, or ask a teacher about their past students, and you are likely to tap into recollections of a very personal experience (good or bad!) - a relationship of some kind. Witness celebrity interviews by 'Parkinson', read notable biographies or hear 'acceptance speeches' for example, and references will emerge about school or university experiences about teachers. Education of a person requires experiences of challenge in a relationship with a 'significant other', even briefly, and recollections of these with teachers are surely 'personal'. They may have taken place in the physical context of a science lab, school concert, or the sporting field, for example, and involved notable or forgettable curriculum and teaching strategies, but the relationships were significant. So when we speak of 'changing the role of the educator in higher education', what do we mean? In this era of 'e-learning communities' in so-called 'virtual learning environments', what are we thinking about changing as we aim to optimise the impacts of the contemporary tools of culture in the education of students? More generally, these questions challenge our concept of the *enactment of teaching* in the broader concept of *providing education*. Contemporary interest in learning communities, communities of practice, and online virtual communities highlights a wider recognition of the extensive and complex ingredients of constructivistic and experiential learning approaches.

An established academic who is very protective of their teaching style and relationship with students may not warm to approaches mediated by technology, unable to imagine being effective in a mediated environment, not knowing how to use the ICT tools of culture. How might staff come to engage the new technologies and models of teaching in an extensive and technology-enhanced learning environment without causing anxiety? We must aim to retain and improve their personal and professional *teacherly* knowledge, and free academic teachers to be passionate about their discipline and their teaching relationship with students (whether physical or virtual) by acknowledging and enhancing the contributions from other ‘educators’ and educational influences available in a comprehensively conceived and extensible learning environment. Importantly, this involves gaining teachers trust of other stakeholders in the educational enterprise - the broader system of inputs to the learners’ quality experiences in a contemporary university. Perhaps this very ingredient of trust has recently been compromised by technology driven agendas that in some cases have unnecessarily burdened academic teaching staff through added workload and system failure.

Areas of potential enduring value for teachers and learners

The new corporate visions, policies and technologies are transforming not only university business processes and organisational structures, but also general personnel roles and the nature and practice of academic work. For example, in Australia, the National Tertiary Education Union is investigating professional development needs and workload outcomes resulting directly from the introduction of online technologies. Within Deakin, the major use of online systems is raising issues about workload and a diminution of the personal and face-to-face character of staff/student relations (Ford, 2003a, 2003b). Reactions to stress are to be expected during periods of massive change, but what sense is being made of the desirable and undesirable changes to the role of ‘educator’ and more specifically the role of academic ‘teacher’ where arguably a notably different role might develop? What should we be seeking as a sustainable teaching role in a quality education setting of enduring value? The *six potential areas* for creating e-learning environments of enduring value (outlined below) portray a community of specialists participating in such an enterprise, all making their educational contributions in relation to a changing role of the academic teacher, still central to the effective enactment of quality learning environments. Moreover, contributions must be conceived in relation to systems-wide education design modelling and a strong set of conceptions of the appropriate uses of educational technologies across the institution. By the former we mean the conception of the interrelated and interdependent domains of teaching and learning activity from the unit and year level to a professional field of study to a portfolio of courses offered by school, faculty or institution. By the latter we mean a set of conceptions of educational technology shaping these domains reflecting student-centred, constructivist learning approaches. We agree with Jonassen et al. (1999; p.13) that the most powerful roles for technology (and by extension the most powerful roles for the new corporate technologies) must encompass:

- Technology as tools to support knowledge construction
- Technology as information vehicles for exploring knowledge to support learning-by-constructing
- Technology as context to support learning-by-doing
- Technology as social medium to support learning by conversing
- Technology as intellectual partner to support learning-by-reflecting.

The following six areas of value creation and maintenance are located within these dual commitments to systems-based design of learning environments and corporate technologies used in the service of new forms of teacher agency and learner development based on constructivism:

First, enduring value can be created through **broadened and direct contributions** to learning environments from institutional stakeholders already involved in learning support. The resources and services of various academic and administrative support groups can be integrated seamlessly and directly with the students’ virtual teaching and learning home. This provides the ‘one-stop-shop’ for all information and services relevant to the students’ learning experiences ranging across various library digital resources and information literacy skills (see Whiting et al., 2003), information technology support and software applications, e-enrolment and tutorial allocation, and advice on academic study skills and career and employment guidance.

Second, value can be generated through an **opening up of learning environments** to diverse external participants able to add targeted value to learner experiences. External parties from the professions, industry, alumni, other teaching institutions and government can be connected using the technologies to contribute to the relevance and meaningfulness of the academic curriculum. As Jonassen et al. (1999; p.10) observe, ‘When learners become part of knowledge-building communities both in class and outside of school, they learn that there are multiple ways of viewing the world and multiple solutions to most of life’s problems’. A key area of contribution to connecting the academic curriculum with workplace learning is highlighted separately below relating to various forms of virtual practica.

Third, automated **customisation and personalisation** of learning experiences for diverse student cohorts enrolled in large, multi-modal courses can be supported through the new corporate technologies. One size of designed e-learning environments may not fit the needs of all student cohorts (Armatas et al., 2003). Even within the constraints of standardised curricula, pedagogies and assessment regimes for large, multi-modal classes, various media and technology channels can be used to provide options catering for different learning styles and needs. Furthermore, resources and activities in different media formats can be selectively and automatically released to different student cohorts depending on the particular rhythms of their study, work and personal lifestyles. The mass production of customizable learning activities is another facet of this value creation area and has been examined, for example, by Holt and Thompson (1998) in relation to adaptive computer-assisted learning software in the professional field of accounting.

Fourth, value can be generated through the **sharing of learning resources** within and between courses created, acquired and accessed by the institution. The technologies facilitate the institution leveraging its buying power in acquiring and accessing multimedia learning resources in high volume from external purposes for multiple internal purposes. Within the institution, home grown media objects (new and legacy) can be created, stored and (re)used in multiple ways in support of the study of disciplines and professional fields at different academic levels, or across related disciplines/fields at the same academic level. Again, the rapid, large-scale usage of various media resources can enhance the authenticity of learning environments.

Fifth, corporate technologies can support the large-scale development of **virtual practica** supportive of grounded professional learning that motivates and engages students. Virtual practica may take different forms from the development of virtual simulations preparing or substituting in part for actual work placements (see Segrave, 2003) through to communications technologies being used to support learners as they undertake fieldwork education, and in reflecting on their experiences post-placement. Additionally, along with bringing academic teaching support to the physical world of workplace learning, the technologies can communicate live to the academic institution, actual work placement experiences for consideration by students on campus. All variants of virtual experiential learning can draw on collaborative as well as individual student engagement. The notion of networked communities of professional practice is integral to the use of virtual practica.

Sixth, the technologies can support the development of **e-learning environments ecologically responsive** to teaching and learning needs and opportunities. E-learning environments should not be prescriptively designed and set in concrete forever. Through systematic evaluation of teaching and learning impacts, the new technologies should easily allow required changes in the structures, elements and resources in what should be flexible, timely and organically developing ways. With rapid change in the knowledges and know-how of disciplines and professional fields, learning environments must be designed and technologically enabled to change in concert.

Conclusion

The newly conceived systems of organisation and communication in knowledge-based enterprises, enable the creation of expansive and highly integrated learning environments in tertiary education. However, while these may be based on the multiple sources of expertise legitimately influencing students’ education, there must also be a trust and respect between parties to the educational enterprise, as

education depends essentially on the quality of relationships between people. Learning environments that evolve due to quality relationships between educational agents will be sustainable and create enduring value. Moreover, commitments to teaching for learning whatever the nature of the environment must take account of all facets of the role of the academic in contemporary higher education, encompassing their passions and interests across the various scholarly activities of research, teaching, consultancy and community service. The new technologies will yield the most use and the greatest value if they provide opportunities for the fullest expression of all facets of the total role of the academic working within the organisational contexts of higher education.

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