Abstract: This paper aims to provoke discussion regarding the use of information and communication technologies (ICTs) in university teaching. In the age of Web 2.0 and the millennial learner, universities face the challenge of ensuring sustainability in teaching, learning, and curriculum design. This issue is examined specifically from the perspective of the training and support needed to equip teaching staff to enhance student satisfaction and outcomes through the best-practice use of ICTs.

Introduction

The future of the Earth has attracted growing worldwide attention. Much of this interest has focused on “sustainability”: the question of how human activities can be managed in such a way as to slow the depletion of natural resources and reduce ecosystem disruption. Although sustainability discourse will continue to focus on critical issues such as global warming or fossil fuel depletion, sustainability has implications for all aspects of human activity. Concepts such as system life expectancies or the impact of within-system feedback loops apply to human and natural systems alike. If we are able to characterize practices as being “more sustainable” or “less sustainable,” we have identified a crucial aspect of any purposeful human activity. The fragility of our existence is constantly being depicted with doom and gloom on our horizons: for example images of treasured and beautiful polar bears basking in sun-drenched polar caps as their habitat diminishes evoke much emotional stress, as do predictions of raised sea levels causing imminent archipelago demise and sending refugees on the run. Along with black gold moving towards its own depletion, thereby reportedly threatening world economic collapse, further examples include families embracing energy-efficient light bulbs in a frenzy, and governments are hurriedly signing treaties (such as the Kyoto Protocol) in an effort to acknowledge world responsibility for addressing the impending crises.

The application of the sustainability discourse to the use of information and communication technologies (ICT) in universities is long overdue. The reason is that the sustainability is critical to long-term success. One of the reasons behind the adoption of ICTs in the tertiary sector was the promise of increased efficiencies. This factor was at least as important as the prospect of enhanced learning outcomes in securing the support of institutional decision-makers for new modes of university teaching. How sustainable is the current use of ICT in the tertiary sector? Are present-day approaches underpinned by real increases in efficiency?

In practice, many of the promised efficiencies have proven elusive. Economies from new administrative systems are perhaps real enough. Unfortunately, it is now clear that the use of ICTs in university teaching is inherently labor-
intensive (at least if done properly). Web-based systems, for example, require significant preparation time, both in terms of the hours spent mastering new technologies and the time spent creating the actual teaching materials. This investment would be tolerable if it usually resulted in a reduction in total teaching hours. However, the reality is that the use of ICT usually involves an increase in teaching hours. These include the time reading and responding to emails, hosting chat sessions, and moderating bulletin boards. Too often, these activities are undertaken out of hours.

In terms of the institutional bottom-line, the use of ICTs has reduced through savings on print-based materials and provides economies of scale. But, there is a hidden cost in terms of additional, and unpaid, teaching hours. As Thompson observes: “Whatever subjective notion of [academic] productivity has been constructed over time now appears quaint in light of ICT changes within the last five years” (Thompson, 2000). At the risk of stretching the application of the sustainability too far, universities appear to be clear felling or strip mining a limited resource (their teaching staff), rather than practicing sensible sustainable management.

The potential of new teaching technologies has to enhance student learning, reduce attrition rates, and improve outcomes has been adequately demonstrated. What remains to be seen is whether current experiments can be sustained once project funding dries up or the initial enthusiasm of early-adopters has cooled. The training and support of academic staff members needs to be carefully rethought and reconsidered if there is to be a capacity for renewable futures in ICTs. Enthusiasm for ICTs is, after all, a limited resource. If universities do not manage it well, it is most likely to become an increasingly scarce one.

It is sometimes forgotten that ICTs are still to take firm root in the tertiary environment. Most reports of research and development in the educational uses of Web 2.0 technologies in particular, and ICTs in general, appear to be isolated, disconnected, and highly contextualized. Few are generalizable to a variety of institutions, academic disciplines, countries, cultures, and student audiences. Clearly, there is much to be gained from the opportunities afforded by these technologies (Beetham, 2005), but it remains to be seen whether our efforts will be sustainable and contribute to the creation of renewable futures, or simply be experimental in nature and concerned solely with individualistic interest.

**New learners, new needs, new expectations: How are universities responding?**

The latest generation of undergraduates live in a Web 2.0 world, one in which individuals employ new ways to create information and to connect with others. The changing profile of the tertiary student (Windham, 2006) has opened up a space for new approaches towards teaching. The distinctions between learning, work, and play at the tertiary level are beginning to blur.

At the same time, major social trends are in evidence. Trends such as the diversification of life trajectories, multiple career paths, re-skilling, and flexible working hours are drivers of learning on-demand (Punie & Cabrera, 2006). For around two decades now, there has been a heightened emphasis on defining and developing the transferable skills that university graduates should possess (Candy, Crebert, & O’Leary, 1994; Assiter, 1995). This has included a growing focus on preparing graduates to be “job ready” (Assiter, 1995; Havard, Hughes, & Clark, 1998). Increasingly, universities are feeling the pressure to provide more than simply subject or domain-specific learning, but also the generic skills sought after by employers: teamwork, leadership, interpersonal communication, initiative, and problem-solving (Spiro, Vispoel, Schmitz, Samarapungavan, & Boeger, 1987)

Now, society at large is beginning to re-evaluate the kinds of skills and competencies that graduates need to possess in order to be prepared for life in the knowledge age (Leitch, 2006). For instance, in addition to social skills and creativity, students must develop sound information literacy skills in effectively finding, evaluating, and creating information. While Web 2.0 and the open content movement has significantly increased the volume of knowledge, ideas, opinions, and representations accessible to tertiary students, many undergraduates still lack the competencies necessary to navigate and use the information available (Katz & Macklin, 2007). Additionally, beyond the tasks of searching and retrieving information, students need to be able to apply strategies of contextualization, analysis, visualization, and synthesis. All these strategies involve complex critical thinking skills that are not always available through the standard curriculum or traditional pedagogies (Lorenzo & Dziuban, 2006).
New demands require fresh approaches towards university teaching. These exist in abundance. There have been numerous evaluations and investigations of the use of technologies (Beetham, 2005). As Goodyear, de Laat, and Lally (2006) point out, there are plenty of stories, vignettes, and case studies with which to engage. The problem is that – as Kirkup and Kirkwood (2005) have shown – most instructors use Web-based technologies and other ICTs only in ways to which they are accustomed. That is, they have a tendency to simply re-create and replicate what they already do, as opposed to using ICT to teach radically new ways. Such a limited approach is perhaps inevitable when the institutional framework for change is lacking. Without explicit policy direction, and adequate resources, it is hard for academic staff to make a break from past pedagogies.

At the ED-MEDIA 2008 conference, delegates will no doubt have the benefit of seeing numerous examples showcasing innovative and novel uses of ICTs. However, we will generally look in vain for signs of coherent institutional responses to the needs and demands of millennial learners. For example, a review of university Web sites has revealed only one dedicated policy response to Web 2.0. This policy was formulated at the University of Edinburgh as recently as 2007 (University of Edinburgh, 2007). Whilst most universities and colleges now have e-learning or online learning policies of some description, very few appear to be engaging deeply with Web 2.0 philosophies. The opportunities and challenges that Web 2.0 present are still not grasped at an institutional level (see also the recent JISC report by Franklin & van Harmelen, 2007).

Not surprisingly, instructor training and support in the use of ICTs is occurring in a similarly unconnected way (Goodyear, de Laat, & Lally, 2006; Jamieson, 2004; Kirkup & Kirkwood, 2005). The professional development of academic staff is typically situated within the short-term, ad hoc needs of institutions, departments, or schools. Development activities are often fuelled by novelty. Few survive beyond a limited period. Event-driven development programs based on seminars, workshops, visiting scholars, and course accreditation efforts encapsulate most current responses to the need for better instructor training and support. Event attendance is now just another performance indicator used for evaluating academic staff member (Collis, 1998; Australian Universities Quality Agency, 2007). What is generally lacking is a structured approach based on institutional-level transformation. Individual initiative is not enough, especially when such initiative is constrained by opportunistic approaches towards the delivery of training and support.

The need for a coherent, institution-wide approach is more pressing than ever before. Individual academics are being asked to engage with the new and constantly changing technological environment. New knowledge is created, even as it becomes evident that what is new today might well be old or outdated tomorrow. Academic staff cannot be expected to find their bearings if their home institutions also lack direction.

Despite these crosscurrents, it is clear that fundamental changes are occurring. For example, Hilton (2006) describes the significance of the move from “producer push” to “demand pull.” Syndication services such as RSS form the basis of podcasting (if used in the “true” sense of the word – see Curry, 2004) and vodcasting, through which students obtain and consume content “on demand.” The hunger for immediate responses and impatience is demonstrably brewing in the millennial students who belong to a new generation that shouts, “I want it now!” (see for example Center for Generational Studies, 2007). Universities that fail to meet this demand are likely to find themselves at a disadvantage in the marketplace. But, how is such a demand to be met in a manner that does not undermine traditional academic approaches towards authority, or threaten to increase the teaching burden on already overworked academic staff?

**An alternative response: University 2.0**

In a recent article, Barnes and Tynan (2007) examine the implications of Web 2.0 and social technologies for tertiary teaching and learning. They discuss how social technologies may be leveraged to meet the new service expectations of learners. In addition, they address the need to move away from instructor-centered pedagogies. The emerging issues and possible future scenarios created by this “brave new world” of possibilities and challenges are explored through the eyes of Miranda, a fictional student at a British university in 2012:

Miranda awoke to the latest hit from Beijing Princess at maximum volume. The ageing speakers attached to her brother’s old Zune Plus did little for the music. Accepting the inevitable, Miranda pointed her iPhone at the Zune. The girl band died, only to be replaced by the audio track from Doom 5.0. Lost in the sound of a Martian apocalypse,
Miranda reflected on the disadvantages of a terabyte of storage. It didn’t pay to shuffle: you never knew what you might find. A SMS arrived from the University administration reminding Miranda she had a tutorial at 10.00 AM. She hadn’t prepared. Time to call Helsinki. On the other end of the line, Ari, the distance student from Finland patiently explained the question. Caliban. It sounded like a breakfast cereal. Then she remembered. The Shakespeare play. Dispossession. How do you spell that? Yes, she’ll send the anime, sorry, this time, she promised. (p. 189)

To attract and retain students such as Miranda, universities will need to rethink their operations. Barnes and Tynan propose the concept of a “University 2.0”:

University 2.0 is not simply a collection of technologies. Like Web 2.0, it is primarily a concept, a way of thinking. A university in Miranda’s world is a place where informal and formal learning occurs, initially over the course of a degree, but ultimately over a lifetime. Miranda participates in parallel communities where personal, educational and professional life lines blur. Miranda participates fully in her educational experiences by cooperating with others to build experiences within an “architecture of participation” (O’Reilly, 2005a). The university acts as a service provider that “harnesses the power of the users themselves” (O’Reilly, 2005b).

The University 2.0 concept seeks to resolve this issue of sustainability by drawing upon the connectivity, generativity, and disruptiveness inherent within Web 2.0.

In addition to the move from “producer push” to “demand pull,” Hilton (2006) discusses how a number of other disruptive forces are shaping the future of higher education. These include: the unbundling of content; the arrival of ubiquitous access to information and services; and the impact of Web 2.0 philosophies regarding collaboration and sharing on traditional concepts of authority and ownership. If universities are to create a sustainable and renewable future, they need to plan constructively for change and to equip their teaching staff to manage the transition to a new form of university. Business as usual is no longer an option. The ivory tower is crumbling.

**What University 2.0 means for instructor training and support**

The professoriate has not engaged easily with developing their own capacity (see for example Teghe & Knight, 2004) or truly considered their own sustainability as educators. The validity of this seemingly audacious claim becomes more apparent when examined in the light of how institutions now grapple with an increasingly well-informed student cohort. In the words of Barnes and Tynan (2005): “Most undergraduates now expect the same level of service from university administrations that they receive from their ISP or mobile phone provider. If they are not happy with a provider, they switch” (p. 197). While their formal qualifications have equipped academics with disciplinary knowledge, their interaction with the Web 2.0 generation pose unmet teaching challenges.

Learning what we think is important to learn, how we learn, and knowing when we have learned must be re-examined. New ways of knowing must emerge from traditional ways of knowing where “telling” and the one-way flow of “chunks” of information from instructor to learner have been dominant (Laurillard, 2002). There is a need to consider what knowledge might mean for the Web 2.0 generation, now and in the future. For example, what value do students, and society at large, place on instructor-supplied content and textbooks (Boettcher, 2006) in the age of Google and Wikipedia? Is it arguable, for example, that the traditional cornerstones of rote learning and memorization are outdated in a world in which the obsolescence of knowledge is taken for granted? (Barnes & Tynan, 2007).

The challenge for instructors is not about keeping up, but rather how to be “on top of” or “on the new wave.” Shifting and responding to the political, socio-cultural, and economic agendas from the numerous stakeholders is no easy task for an academic at the chalk face. In reality, where is the time to think and/or reflect, let alone to build and develop individual capacity? The solution is two-fold. Institutional decision-makers must put in place policies that allow academics the time to build capacity, even if there is a short-term cost in terms of relief hours. They must also reconsider what is a reasonable teaching load, recognizing that ICT-based approaches often require additional hours, not fewer. Finally, they must build sustainability by providing strategically focused academic development programs that aim at institutional-level change, not band-aid solutions.
Towards a new framework for instructor training and support in the sustainable use of ICTs

How can we achieve stability? The essence is to move away from an approach to instructor training that takes impact for granted. To date, we have measured the effectiveness of academic development programs in terms of the number of workshops given or head-counts. Each seminar or presentation has been regarded as a significant milestone along the path to pedagogical transformation. This incidental, almost opportunistic, approach is not enough. What is required are strategies which centre upon the embedding of new pedagogies within the institution as a whole (Dobson, 2001; Oliver, 2000a, 2000b; Oliver & Conole, 2000; Segrave, Holt, & Farmer, 2005) The Embedded Learning Technologies initiative under the umbrella of the EFFECTS (Effective Framework for Embedding C&IT using Targeted Support) project (Beetham & EFFECTS team, 2003a) is an excellent example of a cascaded approach to instructor training and support. By drawing upon an action learning model, individuals within a consortium of universities developed contextual responses that, as a whole, gave rise to an institutional change that was persistent and lasting (Dobson, 2001; Beetham & EFFECTS team, 2003b; Oliver 2000a). In this way, the sum of the individual efforts was greater than its parts. Other similar examples include those described by Alonso, Lopez, Manrique, and Vines (2005); Pospisil and Willcoxson (1998); Saunders and Hamilton (1999); Telg, Lundy, Irani, Bielema, Dooley, and Anderson (2005).

Sustainability on a global scale

The Talloires Declaration (University Leaders for a Sustainable Future, 2001b) was composed in 1990. It details commitment to environmental sustainability in higher education and is a “ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations, and outreach at colleges and universities. It has been signed by over 350 university presidents and chancellors in over 40 countries” (ibid., para. 2). The opening paragraphs of the Declaration read as follows:

We, the presidents, rectors, and vice chancellors of universities from all regions of the world are deeply concerned about the unprecedented scale and speed of environmental pollution and degradation, and the depletion of natural resources.

Local, regional, and global air and water pollution; accumulation and distribution of toxic wastes; destruction and depletion of forests, soil, and water; depletion of the ozone layer and emission of “green house” gases threaten the survival of humans and thousands of other living species, the integrity of the earth and its biodiversity, the security of nations, and the heritage of future generations. These environmental changes are caused by inequitable and unsustainable production and consumption patterns that aggravate poverty in many regions of the world. (University Leaders for a Sustainable Future, 2001a, paras. 1-2)

Web 2.0 technologies and new pedagogies have a crucial role to play here. Changing long-established production and consumption patterns is not a goal easily achievable through conventional pedagogies. Engagement, reflection, and deep learning are best promoted through newer technologies that focus on the task of allowing individuals to construct their own view of the world and their place in it. If we can manage the transition to a University 2.0, there is a good chance that we can facilitate the process of building sustainability on a global scale.

Conclusion

Hilton (2006) uses two competing metaphors to depict the present and emerging tertiary education climate: “a perfect storm, born from the convergence of numerous disruptive forces … [and] the dawn of a new day, a sunrise rife with opportunities arising from these same disruptive forces” (p. 59). The authors believe confronting these challenges require new approaches to instructor training and support. Academic teaching staff must be provided with appropriate guidance as they venture beyond the traditional forms of teaching and learning familiar to them. They will also need assistance in evaluating the sustainability of their pedagogical initiatives, as well as in reflecting
on the impact their use of ICTs have on their students. Hopefully, it is not too fanciful to believe that this reflection will include consideration of their impact on the future of society as a whole.

Creating a sustainable future for tertiary education in a Web 2.0 age depends on a concerted effort at all levels of the tertiary education sector. In addition to instructors and support staff, policy-makers must consider how to enable and support millennial students and their needs. Academic and support staff must be equipped to perform with the level of flexibility and responsiveness now demanded of them. A more holistic, research-informed, forward-looking approach is needed, one that facilitates dialogue and engenders a strong and unified response from all stakeholder groups. Further exploration, investigation, and scholarly debate is needed to determine how to reconcile the need to come up with “the one” answer with the need to respond appropriately to the individuality and uniqueness of specific institutional, departmental and disciplinary contexts. It remains to be seen whether efforts will be channeled into the creation of renewable, sustainable solutions for the future, or continue to simply be experimental and focused primarily on singular and individualistic interests.

References


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