Constructing the café university: teaching and learning on the digital frontier

Cornel J. Reinhart

Cornel J. Reinhart is
President and Consultant at
the Center for eLearning
and eLiteracy, Mooers,
New York, USA and
Bloemfontein, South Africa

Abstract

Purpose – This paper aims to examine changes occurring in the organization and delivery of learning at the level of higher education, and argues that it is now possible to envision the shape and structures of the future digital university.

Design/methodology/approach – Beginning with a history of the basic organizational paradigm underlying the traditional university, this paper systematically explores the impact on this paradigm of new technological and pedagogical innovations: learning management systems (LMSs), learning objects, iPods, blogs, student e-mail, wireless connectivity, Google's search capacity, distance (web-based) education, and blended learning on the pedagogy of tertiary education.

Findings – The physical structure of the university is a consequence of the hierarchically organization of knowledge, the predominant model from the late middle ages through the industrial era. As knowledge becomes more extensive and complex, the old organization is proving inadequate. The organization of knowledge in several dimensions will bring a massive restructuring of institutions of higher education. The new digital university will have the web rather than disciplines and the library at its virtual center with (nearly) infinite access to the larger peripheral world. No longer holding a monopoly on information, the postmodern café university competes with commercial, for-profit institutions of learning, thus offering traditional and new adult learners immediate access and enormous learning flexibility. This enables students of all ages to take advantage of learning experiences from any connected institution, commercial or traditional, in the world.

Originality/value – As a comprehensive and systematic examination of the impact of digital tools in the contemporary university, this paper can offer guidance to university administrators, faculty members, and others involved in the educational process.

Keywords Universities, E-learning, Higher education

Paper type Conceptual paper

Introduction

Commenting on the conjuncture of Martin Luther's theology and the Gutenberg printing press, Eric Erikson warned:

> It would be fatal to underestimate the degree to which the future always belongs to those who combine a universal enough new meaning with the mastery of a new technology (Erikson, 1962, p. 225).

Assuming the truth of Erikson's observation, it seems fair to ask: to what extent has evolving digital ''technology'' influenced the forms and structures, indeed, the ''meaning'' of the modern university? How has ''technology'' transformed the learning process itself? What, for example, constitutes literacy today? What are the goals of educators, the goals of the contemporary university? Can the university remain competitive in the delivery of information? When does the modern university become a post-modern institution?

Fraught with complexity, the answers to these questions challenge the university's deepest organizational structures, the beliefs and routines of faculty and administrators, and the

prejudices of those of us raised in an earlier academic world. Have we, to paraphrase Erikson, combined a sufficiently new universal meaning, a new learning pedagogy, with the mastery of digital technology? While this essay addresses these questions, I am primarily interested here in the learning goals and teaching processes of higher education. Teaching and research necessarily overlap; still, as far as possible, my remarks are devoted to the university as a pedagogical institution.

We are experiencing an economic and cultural transition every bit as revolutionary and dislocating as the movement from feudal to industrial society. The worldwide web now gives us the capacity to reach individuals directly, point-to-point, for marketing, access to data, and for educational purposes. However we might feel about these developments, as educators they are going on with or without us. Students who just ten years ago had little computing or internet literacy come to us now reasonably sophisticated users of both[1]. The post-modern café university permits faculty, administrators and learners of all ages to gather in their local coffee shop connected horizontally to the internet, to their colleagues and to the world; an unprecedented array of digital tools for searching and analyzing, for teaching and learning, lie as close as the next cappuccino. We can argue whether the changes confronting our older educational institutions are ''revolutionary'' or ''evolutionary,'' but it seems clear that profound changes are taking place.

The Oxbridge model

Thomas Kuhn suggested that when the weight of new information grows too heavy for the prevailing scientific (or ideological) theory to support and integrate, it collapses in favor of a new paradigm (Kuhn, 1996). Perhaps, in this context, we can take a moment to sketch the outlines of the modern university. Volumes have been written about the emergence of the western university, its appearance in the late middle ages, its structures and organizational architecture, its functions (see, Rashdall, 1936; Brooke, 1993; and a useful collection of web sources at www.beloit.edu/~ist190/universities.html). From Cambridge University's *A Brief History* comes this interesting description:

> Meanwhile during the late fourteenth century and after, the university began to acquire property on the site today known as Senate-House Hill, and to build on it a group of buildings called the ''schools'' – some of which survive today as the ''old'' schools. Here were the teaching rooms of the higher faculties, where lectures and disputations were held, the chapel, the library, and the treasury, with its chests and muniments. Most of the land and buildings in the town was still in private hands . . . although from the late thirteenth century much was already passing to the new institutions called colleges.
>
> Before the middle of the sixteenth century, the colleges began to play a decisive part in university life . . . . Their heads often served with the vice-chancellor and senior doctors as members of an advisory council which was soon to be called the Caput Senatus. From the sixteenth century until almost the end of the twentieth, the office of vice-chancellor was always held by the head of one of the colleges (University of Cambridge, 2004a).

Western academics recognize readily these ancient institutions. The forms and structures of the modern university were accreting their powers and privileges in the early thirteenth century. We see in this one sentence all the familiar structures of the contemporary western university: ''here were the teaching rooms of the higher faculties, where lectures and disputations were held, the chapel, the library, and the treasury, with its chests and muniments.'' This model: the library, the colleges, the lecture halls, the administrative building, faculty governance (eroded, in time, to be sure) all remain today. The physical architecture of the contemporary university demands these buildings with their associated functions: the paradigmatic architecture[2]. The core of the model however is not physical, it is rather an ancient learning paradigm: the master scholar, disciplines organized by faculties, the lecture, the text and rare manuscripts housed in the library, all erected to serve a specific locale: Bologna, Cambridge, Oxford, Wittenberg, Leuven, Glasgow, Harvard (to serve New England elites), the Sorbonne, the University of Heidelberg, the University of the Free State. Today, of course, these universities, like others worldwide, attract students from across the globe – but they remain residential institutions in their core mission[3].

Our concern here is primarily with the present organization and delivery of learning at the contemporary university and college level[4]. It is possible today to begin to envision the shape and structures of the new digital university. For years, especially as distance education became more popular for administrators and faculty alike, we heard cries of alarm and joy alike that the older university of brick and mortar was soon to be displaced, bulldozed onto the scrap heap of history. Those calls proved to be premature, the old buildings still stand and more important the older teaching structures and routines continue apace[5].

The central organizing feature of the traditional ''Oxbridge model'' learning complex was the lecture (and disputations), the face-to-face meeting between the master and his students[6]. The text lay close at hand to be read and studied, written about and discussed. The earliest examinations were oral with written work, theses, dissertations, essays and articles following. Soon thereafter, scholars organized themselves, and, most significantly, their specialized information, into disciplines, into faculties, to verify master's licenses while establishing and maintaining their discipline's standards (University of Cambridge, 2004b).

Administrators appeared almost simultaneously with disciplines and colleges; their titles remain familiar today: chancellors, vice chancellors, deans, registrars and a host of lesser denizens. Administrators and administration were as essential to the Oxbridge learning model as the master and lecture (University of Cambridge, 2004b). Lectures (particularly for undergraduates and in the more democratically ''open'' universities), had to be scheduled, buildings synchronized with schedules, students needed to know where to go to meet their professors, their masters.

Industrialization heightened and intensified these organizational imperatives. Time, efficiency, economies of scale were as important to good administration as learning – yet, despite some tension they reinforced each other. One major change was that the geographical organization of the university gradually became more extensive and complex. The Oxbridge model required lecturers and lectures; the university served a local market disseminating information to residential students, the text resided in the university library and each institution competed to amass the largest collection of volumes and rarest of manuscripts.

Information: organized and disseminated

What were these scholars, the masters, and their universities attempting to do? The end of the medieval period or beginning of the early modern is distinguished by the French Encyclopedists valiant effort to amass and organize all known information in the *L'Encyclopédie* project (Berthier, 1752; Pannabecker, 1994; Darnton, 1979). The early modern university structures, disciplines and faculties, were organized to collect all the information deemed relevant to their discipline, understanding that the master would memorize the appropriate information, and its sources, then serve as a font of learning for his students. Disciplines were organized hierarchically and vertically, into, for example, the science or humanities faculties and further sub-divided by specialized areas of knowledge into biology or physics, philosophy or history[7]. Denis Diderot, the most prominent of the French Encyclopedists, described disciplines in his article ''ART'' in the first volume of the *Encyclopédie*:

> We began by making observations on the nature, service, usage, qualities of beings and of their symbols; then we gave the name of science or of art or of discipline in general, to the center or unifying point to which we related the observations that we had made, to form a system of either rules or instruments, and of rules tending towards the same goal; because that is what a discipline is in general (cited in Pannabecker, 1996).

On the different approaches of Rousseau and Diderot to their common interest in the *L'Encyclopédie*, Pannabecker writes: ''Diderot's approach was to represent the mechanical arts as disciplinary content; he felt this content needed to be better organized, systematized, written down, and illustrated in order to facilitate dissemination, critical thinking, and progress'' (Pannabecker, 1996, pp. 33-34).

Human development then, for Diderot and Rousseau, was dependent upon proper collection, organization and dissemination of information: ''Diderot probably contributed as much to popularizing the rational systematization of the mechanical arts as Rousseau did to popularizing the importance of the stages of human development in their relationship to pedagogy'' (Pannabecker, 1996, pp. 33-34).

At Cambridge, the introduction of new disciplines advanced rapidly after 1850. The natural sciences and moral sciences were approved:

> As early as 1851 and before 1900 Triposes in law, history, theology, Indian languages, Semitic (later oriental) languages, medieval and modern (European) languages, and mechanical sciences (later engineering) were all established. To develop these new branches of learning a number of new or remodelled professorships were established by the university and by private benefactors, the earliest being the Disney Professorship of archaeology in 1851. The numbers of other established teaching posts remained small, and most undergraduate teaching was done by lecturers, appointed and paid by the colleges, or by private coaches. As numbers of students grew during the last half of the century (matriculations increased from 441 in 1850 to 1,191 in 1910), much accommodation was added to existing colleges ... (University of Cambridge, 2004b).

The lecture served as the critical point of contact between masters and students. As universities grew in size, so also did the lecture hall and class size. Martin Luther's development as a young lecturer at the University of Wittenberg provides a glimpse into the early modern scholar's institutional role. ''Luther the lecturer,'' Erikson observes, ''was a different man from either preacher or monk. His special field was Biblical exegesis. He most carefully studied the classical textbooks ... and his important predecessors among the Augustinians; he also kept abreast of the humanist scholars of his time and of the correctives provided by Erasmus's study of the Greek texts and Reuchlin's study of the Hebrew texts'' (Erikson, 1962, p. 198). Similarly, Luther utilized the latest technologies of his day to disseminate his revolutionary (and later counter-revolutionary) ideas: ''Literacy,'' Erikson writes, ''and a conscience speaking the mother tongue – these pillars of our present-day identity had long been in the building. But Gutenberg had, as it were, waited for Luther; and the new technique of mass communication was thus available to Luther's theological performance, which so attracted the charisma, the personality cult, of a nation'' (Erikson, 1962, p. 225).

Of course this organizational model persists today, with junior lecturers handling the great mass of undergraduate students in large halls while senior ''masters'' pursue their own research, offering specialized disciplinary seminars to small numbers of elite post-graduates. Tragic, but instructive, lecturers today in large American universities, as elsewhere in the world, encounter students in a single lecture class routinely numbering from the hundreds to a thousand or more. Despite these daunting statistics, administrators and faculty continue to affirm the benefits of face-to-face contact[8].

Like Diderot and the encyclopedists of the enlightenment, educators (and the public alike) living and working in the digital age confront the monumental task of organizing and disseminating information. Our new digital encyclopedists are busy creating algorithms they hope will categorize, identify and bring to our laptops information requested a scant second ago. Google's momentary primacy lies in its capacity to organize a nearly infinite range of discrete bits of data, bringing the scholar or layman those ''facts'' most relevant to their search. We have known since Socrates, and before, that information is not knowledge. Knowledge is something more, at its most profound a philosophical and pedagogical mystery. But for the purposes of the Oxbridge learning model, it was sufficient to believe that information organized by disciplines and masters yielded knowledge and could be disseminated to undergraduates and post-graduate students in time-honored ways[9].

Today, however, we are awash in information, each digital search yielding thousands of references to the requested information point. Each of these myriad bits of data is linked to an equally voluminous set of new and interesting references – some scholarly, some ridiculous – but in the end nearly impossible to research and organize exhaustively as scholars were expected to do just a decade ago. As Martin observes, ''the infinitude of

information that is now accessible through the internet dwarfs any attempt to master a subject – it is simply no longer possible to know what is to be known in any area. The responses are to focus on ever narrower or more esoteric disciplines or interests, or to admit that all that can be done is to sample the field'' (Martin, 2006, p. 7).

Birkerts deplores the educational and philosophical results of digital overload:

> The explosion of data . . . has all but destroyed the premise of understandability. Inundated by perspectives, by lateral vistas of information that stretch endlessly in every direction, we no longer accept the possibility of assembling a complete picture. Instead of carrying on the ancient project of philosophy – attempting to discover the ''truth'' of things – we direct our energies to managing information (Birkerts, 1994, p. 75).

Whither from here?

The old Oxbridge learning model seems increasingly unable to bear the weight of the social and technological changes of the twentieth and twenty-first centuries. The old model antedated Guttenberg's printing press and survived, indeed flourished, after adopting mass printing to its own purposes. Oxbridge also adapted to the industrial age, since the end of the second world war becoming more and more corporate in its language and structures.

What strategies will, or can, faculty and administrators develop to confront these new challenges to Oxbridge: from challenges to the university's regional hegemony posed by the internet's global reach, to pedagogical problems caused by a rising flood of information and the increasing irrelevancy of the lecture and disciplinary master. Still, these daunting issues have not slowed student demand for a higher education: student numbers grow exponentially as adolescent and adult learners, South American, Asian and African, acquire the technology and resources to demand a university education. Relevant humanist and digital literacy is, arguably, more necessary now than at any other period in human history (Golden, 2006).

In the last 30 years, the academy has been roiled by repeated waves of educational curricular reform: great books, the old (dead, white, male) canon, the new (feminist, diversity, voice and identity) canon, post-modernism, writing across the disciplines, interdisciplinarity, and the most current and, perhaps comprehensive, the universal calls for active or student-centered learning with the application of rigorous assessment processes to higher education. These curricular clashes suggest (despite the occasional hyperbole of each wave's adherents) that content may not be central to the learning experience[10]. Nor, it seems, is discontent with the Oxbridge learning model exclusively a technological phenomenon[11].

The lecture has been dying a slow intellectual death for some years now. It is widely and loudly denounced at most contemporary academic conferences and meetings. Active-learning strategies have long since swept the field, now taken up by most accrediting institutions as the standard for excellence in learning. Assessment discussions and institutional assessment plans likewise feature active-student engagement as a core principle for learning in higher education. Technology certainly has played a role in accelerating these trends but it is not the sole driving force.

Conceptual models for online learning

Norm Friesen has explored the divergent and, later, convergent, paths traced by the Anglo-American term *didactic*, meaning approximately what we understand by ''training'' or ''pedagogy,'' and its German analog *Didaktic*, meaning roughly the same thing as ''humanistic education.'' At the turn of the twentieth century, John Dewey's notions of instructional theory closely paralleled the Germanic *Didaktic*, a broad understanding of learning and human development. By century's end, however, Edward L. Thorndike's behaviorism had eclipsed Dewey's pragmatic and ''experiential'' philosophy, creating a divide between the two traditions.

Friesen sees these two different learning traditions now converging, partially as a result of developments in learning technology, as both traditions struggle to incorporate

microlearning scenarios characteristic of much web or computer-based instruction. Friesen explains, ''learning displays a contextual and organizational complexity that is irreducible to the 'generalized structures' of pre-defined classifications and sequences.'' By ''pre-defined classifications and sequences'' Friesen means: learning object metadata, simple sequencing and learning design among other ''components'' presently engaging Anglo-American researchers interested in ''re-arranging small, recombinant resources to constitute given instructional sequences . . . '' (Friesen, 2006, p. 9). Similarly, and ironically, other educators and technologists, borrowing from the Germanic model are busy trying to ''recontextualize'' these same resources. ''Microcontents,'' Friesen concludes, ''cannot be recontextualized simply in accordance with the established sequences of a given web *didaktiks*.'' Broader humanistic considerations, in other words, must provide a context for more specifically focused lessons to be meaningful (Friesen, 2006, p. 10).

Understanding the struggles of the older learning paradigms to incorporate digital learning will help us to evaluate the usefulness of digital instructional tools such as learning objects, learning object metadata, and learning management systems. Norm Friesen's observations help us to reconceptualize the learning goals, architecture and implications of contemporary ''learning management systems.'' Friesen calls our attention to Lucy Suchman's (1987) observation that plans serve only as rough guidelines for activities, gaining their full meaning only when realized in action or, expressed differently, human plans (read LMSs) only attain their full potential when they shift from ''control structures that universally precede and determine actions, to discursive resources produced and used within the course of certain forms of human activity'' (Suchman, 2003, p. 299; cited in Friesen, 2006, p. 10).

Changing of the guard?

''Technology,'' in the form of web-based or online learning, grew out of the adult education movement that created numerous distance programs in and outside major residential universities and colleges beginning in the late 1960s and early 1970s. In America, these years saw the appearance of the College Park division of the University of Maryland (actually created after the second world war to serve American military personnel and their families serving abroad), some 25 Ford Foundation funded University Without Walls programs, Empire State College in New York, and many similar adult outreach programs for adult learners across the nation (Maehl, 2000).

In Europe, similar pressures to educate adults free of residential requirements led to the appearance of the UK's world renowned Open University and similar institutions on the continent. Most of these efforts, however, necessarily focused on individualized studies. With adults scattered by geography, work and the pressures of family life, the only viable means of reaching these non-traditional learners was by mail and telephone (later by fax and e-mail). By the late 1990s, the appearance of the internet created opportunities for genuine classroom experiences using first the synchronous chat room and quickly after the asynchronous bulletin board to create a seminar and learning community experience for adult students at a distance (Reinhart, 1998; Reinhart, 2005).

While traditional residential enrollments in the US are virtually stagnant, the number of online, non-traditional students is exploding. At UMass Online enrollments have quadrupled to 9,200 students since 2001. The majority of these online enrollments are non-traditional students between the ages of 25 and 50; 30 percent are from outside Massachusetts – this despite paying slightly higher tuition than their residential counterparts. Pennsylvania State's online program is also growing rapidly with a total of 5,691 students in 2006 up 18 percent since last fiscal year. Noting the rapid expansion of American public universities into the online environment, Gary Miller, associate vice president for outreach at Pennsylvania State, a public land grant institution, asks: ''the question in our case wasn't, 'should we do this?' but 'how do we do it right?''' (Golden, 2006). ''Doing it right,'' may be as much, or more, a pedagogical question than an economic one: to put more precisely, online pedagogical choices, online ''environments,'' may have as much to do with economic outcomes as student learning[12].

Skidmore College's University Without Walls program offers a useful instance of these significant technological and pedagogical developments. From its inception, Skidmore College has been one of America's small but prestigious residential colleges, in its earlier years serving elite young women from America's most distinguished families. In the late 1960s, a slim majority of progressive faculty members decided to support an unusual experiment – to create an individualized studies program offering Skidmore College's bachelor's degree to adults living at a distance[13]. The resulting University Without Walls (UWW) program was funded for a short period by a Ford Foundation grant (the same funding source for over 20 other UWW programs at large and small colleges and universities) then later formally adopted by Skidmore College in 1972. Until 1997, all of UWW's adult students, scattered around the globe, were served by surface mail, telephone, fax, and e-mail. During the spring term 1997, UWW offered its first online course, ''America in the Sixties,'' abruptly revolutionizing how UWW worked. Suddenly, the technological means were at hand to create genuine ''classes'' of widely dispersed students; learning communities grew from individual students meeting and talking with each other, first, in a single class, later from contact in numerous learning experiences. Currently, UWW has expanded its catalog of online courses to well over 100 (a tiny fraction compared to larger adult distance programs like Empire State College, University of Maryland at College Park, the SUNY Learning Network, UMassOnline, or Penn State, to name just a few).

Borrowing from John Dewey's notion that information is not knowledge, indeed, that knowledge is socially constructed; the UWW asynchronous seminar was from the beginning quite successful. UWW's pedagogical and *Didaktic* approach sought to duplicate – online – the seminar experience of a quality post-graduate education (Reinhart, 2005)[14].

Asynchronicity[15]

UWW built its online learning architecture – the core of its new learning paradigm – around the asynchronous ''bulletin board,'' consciously rejecting lectures as simply another reading online, eschewing as well the use of the then more current synchronous ''chat room.'' For adult learners, the synchronous ''chat room'' simply makes no sense whatsoever: it requires adult student learners, not in residence at the college or university, with jobs, family responsibilities and, yet more difficult, scattered over disparate global time zones, to be at a computer at a specific time, a ''synchronous'' moment convenient only to the instructor. More significantly, the ''chat room'' was a dreadful learning environment – it offered the worst possible metaphor for an Oxbridge ''face-to-face'' discussion imaginable. Student and faculty comments and questions could not be handled with deliberation or any degree of reflection; facilitator and students alike crowded onto a queue that crawled inexorably ''up'' the page until good comments and suggestions simply disappeared. If anyone, including the instructor, couldn't type, or think sufficiently quickly, the entire ''learning'' experience became a nightmare of hoping to get a word or phrase into the conversation, somewhere, somehow (Payne and Reinhart, 2004).

Despite these apparently overwhelming obstacles, the ''chat room'' seemed for many faculty and administrators most like their familiar Oxbridge model. The resulting struggle at UWW yielded a compromise: faculty who wished to use the ''chat room'' could do so, but as an ''office hour.'' In this way, students could ''arrive'' voluntarily at the faculty member's ''office'' and, with fewer learners in attendance, actually expect to have their questions answered. Later, valued dialogue from this ''office hour'' could be sifted, copied and posted to the asynchronous bulletin board for other students' more thoughtful, less pressured consideration and comments. It is interesting how unsuccessful the chat room as pedagogy is, while students engage continuously in instant messaging[16]!

Learning management systems

UWW also chose to build the remainder of its prototype web course site – the first Skidmore College online course: ''America in the Sixties'' – from the raw language available then to create applications for the web: Hyper Text Markup Language (HTML). Quickly however, the first commercial learning management systems (LMS) appeared on the market to ''facilitate'' better student and faculty administration with a promise to create online architecture

congenial to good learning. Blackboard and WebCT (now merged) rather quickly came to dominate the marketplace. Almost as quickly, a range of criticisms emerged from faculty, students and administrators alike about these commercial products. From an economic perspective, they were hailed as inexpensive until the first, and subsequent, contract renewals came due. Likewise, they ''branded'' their ''LMS'' product to the larger exclusion of the college or university client. More troubling from a pedagogical point of view, they were often boring, clumsy to use for students and faculty and suffered from template rigidity, so inflexible that faculty could not find ways to create their unique individual ''voices.'' Having trained faculty at an enormous social cost it seems useful to allow them to express their specialized creativity. Likewise, entire disciplines found the LMS almost useless for learning in their areas, especially true for the arts, humanities and history faculties.

Characterized as ''tools,'' the early LMS was typically designed by persons with excellent technical skills but little understanding of learning, practical or theoretical; in effect a ''didactic'' tool designed without a clear understanding of its broader contextual purposes. The rapidly expanding interest in open source LMSs draws its vitality from the dissatisfaction experienced by both faculty and administrators with the host of problems associated with commercial LMSs. Moodle in Europe and Sakai in America seem for the moment to be the most viable open source systems and will undoubtedly grow and flourish as additional colleges and universities come to adopt either system[17].

In a short time, the less than perfect learning ''systems,'' the early core of an emerging digital university model, came to dominate the adult distance education market springing up not only all over America, but – as another manifestation of globalization – around the world as well. Despite deep reservations on the part of some faculty and administrators, LMSs, especially WebCT and Blackboard, were soon being used by residential institutions and faculty to supplement their face-to-face lecture format. This variant on distant education (and the Oxbridge model) was quickly popularized as blended learning. At first, blended ''classroom'' instructors found web connectivity useful primarily to post assignments, make announcements and offer reminders. Soon this early pragmatic utility gave way to seeing the pedagogical value of opening one or more asynchronous bulletin boards so that students could discuss with each other ideas perhaps already raised in the lecture but where time and numbers precluded fuller discussion. Similarly, in the most recent use of the LMS, lectures, once the centerpiece of the Oxbridge learning model, are posted, archived, as ''learning objects'' for students to download and read at their leisure while the course increasingly proceeds online in small discussion sections created and facilitated by one or more instructors. In effect, the early adult education distant programs, characterized by individualized asynchronous studies, flexible schedules, and non-residential student learning became the learning frontier for the new digital university. To shift metaphors, the LMS adult education snake – swallowed its lecture-centered, residential, fixed buildings and rigid schedule – tail.

Several useful examples of these general observations can be taken from the experience of lecturers at the University of the Free State, a residential institution of 25,000 students located in Bloemfontein, South Africa. At a recent WebCT faculty development workshop, two presenters discussed interesting ''cutting edge'' uses of blended learning in their own residential classrooms. Nel, from the Department of Computer Science and Informatics drew her audience's attention to the crucial need for purposeful online course design, building in student-faculty interactivity: ''interpersonal interaction can only be effective if it is intentionally designed into and integrated into the course'' (Nel, 2005).

Thomas, from the Economics Department, described the overwhelming task of instructing 1,400 residential students registered for her fall term 2006 ''Introduction to Economics'' module/course; imagine 1,400 students for a single face-to-face learning experience[18]! With numerous regional languages in the Free State province, the university offers all modules in two languages (English and Afrikaans) and, in this instance, in twice daily sessions (day and evening). For the university, these concerns create an enormous scheduling challenge. For Ms Thomas, the difficulties are equally daunting. Since many students fail to see the value of sitting in a cavernous hall, they gradually stop attending; only

a tiny fraction of those actually enrolled are physically present. Likewise, Thomas, as any good instructor, wants to believe her students are learning and her efforts are not in vain. From necessity, and wishing to deepen her student's learning, Thomas turned to the University's LMS, WebCT, to solve these complex logistical problems.

After several false starts, Thomas currently prepares two weekly lectures (once in English, largely for black students and again in Afrikaans, for white students) as posted reading items – essentially ''learning objects'' that all students can access whenever convenient, ending the absolute necessity for all students to attend scheduled classes. Thomas meets with those students who do come to the twice weekly ''lectures'' but now these once mandatory classes have the ''feel'' of an authentic learning experience – a give and take between facilitator and interested learners. Only those students truly interested come and those participate more fully, asking questions and exploring ideas with Ms Thomas.

These extreme face-to-face conditions help us to understand why the intellectual center of the module gravitated to the small group discussion sections Ms Thomas organized on her own initiative. Thomas reassigned her upper level student tutors, originally designated grading assistants, as discussion facilitators. Now, each tutor is given several small ''discussion'' groups (10-20 per group). Yet, even here, the complexity of time and available physical spaces is overwhelming. Thomas' solution utilized a bulletin board with each junior facilitator meeting their group asynchronously. It is here, with Ms Thomas monitoring in the background and periodically meeting with her numerous ''discussion facilitators,'' that the difficult questions regarding macro and micro economic theory, bell shaped curves, supply and demand interstices and related complexities are expressed, discussed and ultimately transformed from ''information'' to ''knowledge'' (Thomas, 2006).

Simulations

Recent innovations (or challenges) to the Oxbridge lecture model have also proved to be useful and exciting pedagogical experiments for online learning. Simulations have been around for some years in residential classrooms, the most famous and widely adopted in America being the highly successful model UN and model OAS. Perhaps not surprising, given the resistance of higher education administrators and faculty to bend or transform the lecture-centered format, these exciting simulations of real world diplomatic institutions were introduced in America by high school and elementary level teachers. Simulations, of course, grew from the felt need of many teachers and some university educators to directly involve their students in the learning experience, to move from unidirectional lecture to multidirectional interactivity; to allow students to bring their own interests, research, diversity and complexity to the center of the learning activity, in short to move from passing along information to socially creating knowledge[19].

The creation of a Harvard University model UN course, bringing numerous high school model UN programs to Cambridge, Massachusetts each year, immediately lent legitimacy to the simulation as valid pedagogy. Still, limitations of classroom architecture and the challenges of synchronous scheduling create difficult logistical (putting aside traditionalists' pedagogical concerns) barriers to the wider use of these powerful simulations.

While the drama of the General Assembly session remains and will probably always remain a wonderful learning experience for students, nevertheless, a common website and useful simulation software could greatly enhance simulations like the Model UN and model OAS. The internet's capacity to connect classrooms widely scattered around the globe, coupled with the computer's enormous capacity to build models, to design interactivity, to access and maintain data, makes for an extremely valuable tool, enhancing existing face-to-face simulations while equally successful entirely online simulations evolve[20]. Many of these same remarks apply to online service-learning modules or courses (Naudé and Reinhart, 2005).

Another exciting example of the potentialities of online simulations is evolving at Second Life (http://secondlife.com) a website developed by Linden Labs. Launched in 2000, Second Life counts among its key investors, Amazon.com founder Jeff Bezos and eBay founder

Pierre Omidyar (Newitz, 2006). Linden Lab offers educators a discount to host their classes or modules on Second Life servers and ''inside'' its software architecture. Educators are free to use Linden Lab's model creation tools or to find and purchase ''inside'' Second Life (using Linden dollars), the models or simulations already created by other educators (or Second Life subscribers). This concept has enormous educational potential. Imagine for a moment that Second Life was the sanctioned creation of a real world university or consortium of universities, legally certified to grant educational licensees, certificates and degrees. Safely ensconced inside the software boundaries of Anywhere State University, Second Life faculty and students meet to create virtual worlds, bringing their own ''real world'' experience, scholarship and research to their learning, in the process creating stimulating educational models: historical, medical, biological, geographical, chemical, anthropological or other disciplinary or transdisciplinary exercises[21].

Imagine further, a ''course,'' or synonymously, a ''world'' where slavery exists. A world populated by the diverse characters, ''avatars,'' involved in the pernicious trade in human beings, a legal trade spanning four centuries and encompassing the entire globe. Learners can be expected to develop, elaborate and give context to their avatar's ''identity,'' drawing upon real world historical records, primary and secondary[22]. We encounter in our virtual world: the captains of slavers (slave ships); merchant traders from Bristol, Glasgow, Boston, Providence, Porto, (among many other old and new world harbors) shipping to the coast of Africa and beyond; plantation owners from Brazil, the Caribbean and the American South; African kings, their kingdoms and empires; slave-owning priests and evangelical slave traders; black and white abolitionists; individual slaves, field hands and house servants; industrialists and financiers. Given an opportunity to develop their characters personalities, to play roles within the limits of historical validity, learners can be expected to identify with their characters and interact passionately with the other avatars populating their self-created world, a world made by slaves and slave-owners alike (Genovese, 1969).

Such a simulation offers opportunities for true transdisciplinary work, testing the skills and developing the digital literacy of all its learner inhabitants, teaching the tools and perspectives of historians, geographers, anthropologists, economists, the skills of business, graphic arts, cartography, music and drama. Similarly, the student and faculty participant-creators of this virtual world might represent every region of our real one: some, hailing from former slave trading ports of Europe and America; others, growing up near the great Portuguese ''castles,'' the several west African ''Doors of no Return;'' Afro-Caribbean and African American descendents of slaves.

Student group web projects

The internet also offers instructors and students opportunities to create and share research assignments – group web projects. Like simulations and journals, educators have utilized group projects for years, especially at the elementary and high school levels. Educators at the university level assigned group projects with some regularity from the mid-to-early 1960s. Like simulations, group projects created structured occasions for direct student class participation; instructors knew, from experience, that students learned more by discussing their research findings together and, as an educational bonus, developed useful social cooperation skills[23]. Group projects in synchronous class situations also demand that instructors devote considerable classroom time to project presentations. Asynchronous web projects solve many of these logistical problems while permitting learner teams to share their work globally.

Blogs and other ''learning tools''

As quickly as tools and terms emerge from new digital technologies, educators now are adapting and adopting them for their own pedagogical purposes. In fact, students bring them to the traditional classroom faster than instructors discover them. ''Blogging,'' like the use of the iPod and wireless connectivity is creating yet a new generation of pedagogical possibilities in this already revolutionary digital age. Since at least the mid-1960s, students have been asked to keep journals. As with simulations, innovative faculty members sought new methods to ''talk' with their students, to broaden one-sided conversations. Increasingly,

instructors asked students to record their more private, introspective reflections on their formal learning. Typically, instructors' evaluations were quite broad, ranging from simply noting their occurrence to structured reflective exchanges. The single failure of these innovative pedagogical exercises was journal observations created at best a two-way dialog, better than a monologue, but marginally.

Amazingly, the online journal (blog) turns this seldom-used pedagogical innovation on its head. Offered an opportunity to ''blog,'' students create enormously interesting learning edifices willingly sharing wonderful insights with fellow students and instructors. Since students choose what to include, and share, issues of confidentiality fade away. Learners employ their blogs as personal spaces to record sorrows and joys, the death of a grandparent or friend, a career success, a life milestone. Building camaraderie and lasting friendships, these postings ''soften,'' personalize and communalize the online classroom. As important are the learning ''threads'' students build – unimagined by the instructor and perhaps unimaginable at course's outset; students blog to bring new information – initially perhaps of unique interest only to themselves – to the entire class. By sharing with others, students begin constructing knowledge, socially; they create new conversational threads – the sinews of learning. These conversational threads, discussion tracks, can be viewed, switching metaphors, as laying new neural tracks in the brain itself. Yet acquisition of information is crucial but not sufficient; the process of acquiring and reflecting on new information marks only the first stage in learning. It is in the sharing and discussion of acquired information (new or old) that students begin constructing knowledge (Dewey, 1966; Winn, 1997)[24].

The major caveat to blogging's heuristic value concerns the possible loss of spontaneity and authenticity occasioned by instructor-assigned blogs. Steven Downes worries about the loss of creativity:

> It seems clear that although blogging can and does have a significant and worthwhile educational impact, this impact does not come automatically and does not come without risks. As many writers have noted, writing a weblog appears in the first instance to be a form of publishing, but as time goes by, blogging resembles more and more a conversation. And for a conversation to be successful, it must be given a purpose and it must remain, for the most part, unconstrained (Downes, 2004).

Electronic portfolios

Only recently have educators begun to consider the usefulness of electronic portfolios for individual students. Limitations of computer memory and the absence of adequate database tools precluded serious consideration of creating and maintaining learner electronic portfolios. Already students maintain digitized records of their curricular and extra-curricular activities. Soon educators will routinely admit students after evaluating electronic portfolios; institutions at all levels will be asked to facilitate student digital work and we can expect portfolios to be internet-stored and accessed.

Even now, as more robust databases become available to institutions of higher education (similar to the capacity and organizational power of corporate databases), we see growing interest by faculty and administrators for creating individual portal accounts allowing learners access not only to routine administrative functions like registration, fee payments, schedules and university news, but as importantly, to maintain a record of their writing, research and creative work. At its most exciting, individual portals afford students opportunities to assemble their own learning tools from among many of those considered here but also from a range of emerging digital learning resources: a student's digital ''kit'' arrayed in the service of a constructivist learning paradigm.

Podcasting

Portable and wireless technology continues the digital erosion of the Oxbridge model. A recent survey of American college students indicated that 25 percent (up from just 15 percent in 2005) owned Apple Computer's market dominating music delivery system, the iPod. Ironically, but not surprisingly, recording lectures and making them available for

downloading from Apples iTunes Music Store is the first genuine educational use for this enormously popular portable technology. Apple has set up an exclusive section at iTunes – iTunes U – available only to students and faculty of participating universities. Apple officials have also hinted that they might sell textbooks, course packets or other educational products through their rapidly evolving iPod U (*Chronicle of Higher Education*, n.d.). The BBC reported on its website and in its video broadcast, the then cutting edge news: ''Lecturer drops lectures for podcasts.'' ''Some lecture classes have 250 students,'' said Bill Ashraf, a microbiology instructor, ''so I question the effectiveness of a didactic lecture for an hour'' (Spicer, 2006).

While podcasting offers extraordinary flexibility and immediate visceral appeal it remains crucial that it, like similar valuable digital tools, serve the learning purposes of the contemporary age, the active-learning strategies of the Constructivist Digital University. Portability is extraordinarily important, but as a mechanism to deliver lectures – even as ''learning objects'' – it has limited utility. The crucial missing element is interactivity; allowing students to record and share their self-created learning experiences with facilitators and, more importantly, with fellow learners. Any effort to recreate the Oxbridge lecture model, either online, with iPods, or in any other fashion, is doomed to failure if it runs counter to the constructivist pedagogical movement of the last half century. Technology must serve the goals and purposes of educators, not the reverse.

Other ''cutting edge'' resources

We are running out of terms to describe the depth and speed of new technologies. It might be useful here to consider briefly a thin slice of the ''learning object'' notion. When the concept first appeared it was difficult to understand and did not seem immediately useful, precisely for the ''contextual'' objections raised by Friesen (2006). Placed in the context of constructivist pedagogy, the value of learning objects becomes clearer. Since thousands of instructors in residential universities and colleges, teach the same or slightly modified course or module every term, it seems obvious that if we can archive the ''standard'' Psych 101 lecture so that other faculty members can use it for their course, we can save thousands of hours by eliminating duplication, often taken from the same text and reference works. MIT's decision to put all of its lecture materials online is already a major step forward in this regard (online at http://ocw.mit.edu/OcwWeb/index.htm). While frightening to some, the reality is that this material is often not worthy of copyrighting; the time to prepare these introductory lectures could be better spent on creative enterprises. Similarly, the lecture as ''learning object'' is now made available for students to read (or listen) at their leisure, asynchronously and without the necessity to attend a classroom to hear the same material presented to 50, 100, or more somewhat bored students[25].

Murray Turoff, an early digital learning pioneer, recently offered an interesting illustration of these exciting learning opportunities in a discussion thread appearing on Sloan-C, the Alfred P. Sloan Foundation website (www.sloan-c.org). Struggling with the typical array of conflicting state regulations, university policies, enrollment and disciplinary restrains, Turoff creatively advertised four separate special topic courses: two at a distance and two face-to-face, encompassing both graduate and undergraduate learners. The combined ''course,'' ''Design of emergency management information systems,'' quickly enrolled a total of 28 students, sufficient to satisfy the minimum of 15.

Recording his face-to-face classes, Turoff divided the lectures into 30 minute segments. Using his SONY editor, he converted the proprietary audio files to wave files, then utilized ''itunes'' to convert these to an MP3 format. Lastly, these files were ''uploaded'' as attachments to a WebBoard entry. Students could view Turoff's PowerPoints and/or listen to the lectures and face-to-face discussions on their PC or could download the audio to their iPod. Not satisfied with simply podcasting his lectures, Turoff's most innovative active-learning strategy involved creating an asynchronous bulletin board requiring all students, face-to-face or at a distance, graduate or undergraduate, to participate in a common learning conversation.

The constructivist digital model

Taken together these illustrations provide a glimpse of the emerging digital classroom. The web will supplement or replace the traditional classroom, and do so rather quickly. The current struggle over the form, function and texture of learning management systems will sort itself out and (one can only believe) the victory will go to the most open-sourced, flexibly designed, learner-centered environment (commercial or open source). The extension of the asynchronous seminar (bulletin board) space, pioneered by distance learning instructors, to traditional classroom settings holds the promise of engaging the majority of learners in meaningful written exchanges with fellow students and the professor alike. Likewise, collaborative student projects seem to be an obvious use of the web, both for creation of team activities but also for sharing their productions with other students (and observers) locally and worldwide. Blogs, simulations and archived student efforts, that is, ePortfolios that travel with students during their entire academic careers, begin to sketch the outlines of a new learning paradigm, a non-residential Constructivist Digital University offering asynchronous flexibility and enormous opportunity for creative active-learning strategies.

While we seem to have acquired the necessary digital tools to see the faint silhouette of post-modern tertiary learning, we are still some distance from reshaping, reconceptualizing, the Oxbridge university model. Perhaps the two most significant remaining barriers to fundamental change are the university library and the ancient disciplines. Both of these hoary Oxbridge units appeared virtually simultaneously with the University during the late fourteenth century (as previously noted, University of Cambridge, 2004a).

It is ironic but fitting that Cambridge University's library now leads the effort to open source all or most of its library holdings. The ambitious objective of the DSpace@Cambridge Project is to develop an institutional repository to preserve and disseminate digital materials created or associated with Cambridge University. The project utilizes DSpace™, an open source digital repository software platform developed jointly by the Massachusetts Institute of Technology (MIT) Libraries and Hewlett-Packard Laboratories (online at www.lib.cam.ac.uk/dspace/index.htm). We are still a long way from Alexander of Macedonia's dream of collecting all the knowledge in the known world in one location, the Alexandria Library in Egypt, or the similar goal of the Enlightenment's Encyclopedists, still, never before could humans envision a time when the collected works of the world's largest and most important libraries would be available to scholars, students and the lay public alike. Using the powerful search tools currently deployed by Google, with the near certainty of newer search technologies emerging, the world's entire repository of knowledge will soon come to the individual researcher rather than he or she having to travel at great expense to local repositories, primary and secondary. The need for each and every institution of higher learning to acquire significant library holdings to support student and faculty research and study is, in truth, already behind us[26].

Like the library, disciplines (schools, colleges, faculties, departments) lie at the organizational heart of the Oxbridge university model. Authority flows from the universities vertically-organized disciplines; faculty lines are embedded in dean's and chair's budgets. As refined by Wihelm von Humboldt at the beginning of the nineteenth century in his plans for the University of Berlin (now Humboldt University), which became the model for the modern research university, there is also a hierarchy of disciplines with Philosophy at the apex. This is intended to give cohesion to the separate areas of study, integrating all knowledge into an elaborate pyramidal structure. Work across the lines of disciplines has tended to undercut this organization, and for that reason it is condescendingly regarded as ''speculative'' (von Humboldt, 1963).

Evolved to collect relevant information, the issue for disciplines today is not can we gather sufficient information or support a faculty with adequate library resources, but rather too much information. For some time now, the central administrative fault line runs between the ancient disciplines' pedagogical authority and budget dominance and the insatiable pressure for transdisciplinary ''projects,'' academic enterprises and funding that cross traditional research and pedagogical boundaries (Sax, 2006)[27].

The essential problem confronting contemporary administrators, steeped in Oxbridge traditions, but often ill-trained digitally, is that information – its collection and dissemination – is now a multi-dimensional enterprise. Data arrives and departs from multiple nodes, an almost infinite variety of web-accessed or distributed information, processed with a perplexing array of digital tools, hardware and software, requiring specialized knowledge and training. We are drenched in information; the web allowing each of us to follow ''facts,'' data, wherever our interests and research imperatives take us. The web's hyperlink capabilities offer horizontal and vertical discovery; we routinely track information across any and every disciplinary boundary. As the logic of the discipline-centered university erodes, the remaining organizational vestiges inhibit the growth of replacement structures[28].

Disciplines will no longer behave as vertical towers of information gathering and dissemination, as organizational entities with exclusive budgetary and decision making responsibilities. Still, the elevation provided by standing on the wreckage of the ''old schools'' does not allow us to peer far enough into the future to see clearly the organizational structures of the new university. Yet, sifting through the accumulating ruins of the ''old schools'' can perhaps offer useful insights and delineate contextualized trends.

The extraordinary capacity of geographical information systems (GIS), for example, to layer and spatially-relate disparate databases, models the infusion of digital mastery into a traditional discipline. At a recent GIS conference, Professor Barker argued that the traditional geographical curriculum provides the framework, the grammar, which all geography students, first year to doctoral, must master to earn their disciplinary degree. He noted, however, that the vocabulary of contemporary geography is GIS (GIS Conference, Bloemfontein, SA, August 22, 2006).

Provoked, the delegates debated the essential nature of GIS software: was GIS simply another ''tool'' like Microsoft Word or Excel or was it an integral part of the ''real'' curricular imperatives of the discipline, at bottom concerned primarily with imparting spatial relationships to students. Clearly, GIS software has so infiltrated the processes and products of the traditional geographers' craft that they are inseparable. In less than 15 years, the entire modern geographical disciple, dating from the mid-nineteenth century, has undergone fundamental transformation. Once tiny bastions of academic enterprise, with faculty and students laboring over maps and drawing tables, today geography departments are awash with students of all ages clamoring to attain the GIS literacy requisite for professional employment.

More important for illustrating university-wide trends, GIS is increasingly a vital transdisciplinary tool for sociologists, anthropologists, historians, criminologists, urban planners, indeed any practitioner, academic or otherwise, trained in a traditional discipline that wishes to organize and/or represent data spatially. Facts are no longer gathered, transmitted and disseminated only vertically, up or down, the disciplinary tower. Rather, the post-modern Café University encourages administrators, faculty, and learners to work in their local coffee shop connected horizontally to the internet, to their colleagues and to the world. Their wireless laptops replace the text and the library carrel; an unprecedented array of digital tools for searching and analyzing, for teaching and learning, lie as close as their next cappuccino. If form truly follows function, as it must, we can safely predict that the new university will organize itself along the lines of its emerging structural imperatives, following the lateral vistas produced by the infusion of digital processes and digital languages into the informational heart of the ''old schools'' (Birkerts, 1994, p. 75).

Conclusion

While we continue to grope for a completely satisfactory new teaching/learning and technology paradigm, perhaps the outlines of the new digital Café University are becoming clearer. If information collection and the ''old schools'' are no longer at the center of the new university, what is? The web's capacity to archive and access information, to serve as a repository for enormously powerful software tools and processes, suggests a useful organizational metaphor: like the spider's web it harkens, the internet allows a digital structure: a central organization with infinite points of contact on the periphery: total,

non-residential interconnectivity. The new digital university will have the web, rather than disciplines and the library, at its virtual center with nearly infinite access to the larger peripheral world[29].

What might the "periphery" be? Most likely, we will see an extension of the array of contemporary institutional forms, but with adjustments to cultural and technological changes. Undoubtedly, many well-established research institutions will continue, but with increasing cross- or transdisciplinary work. Programs rather than disciplines will garner an increasing share of budgetary resources. We can confidently expect a proliferation of the online extension of university programs, certifications and courses for traditional and non-traditional students alike: By early 2008, Lois Romano reports in the *Washington Post* "about one in ten college students will be enrolled in an online degree program" (Romano, 2006). Adult learners, graduates and professionals especially, will look increasingly to university centers for online certificate programs to develop or renew professional skills.

University and college library budgets will be devoted increasingly to digital resources (journals, search engines, digitization of collections) or diverted to the university's eLearning unit. We can expect increasing globalization of library materials along the lines of DSpace@Cambridge; Goggle and/or others will reach deeper into library archives to digitize older print, manuscript and analog collections. The regional university, once serving only a geographic locale, will now compete, as well as cooperate, globally with other large research institutions for students and learners, extending its specialized information via courses, workshops and online conferences to individuals and communities everywhere in the world. The University of Wisconsin, to take one example, will continue to serve Wisconsin and the Midwestern states of the US, but it's history department and associated unique collections held at the Wisconsin Historical Society (www.wisconsinhistory.org/libraryarchives) will become further available to scholars and students around the world.

Many of these same observations apply to the enormous array of medium to large universities serving American states, other countries, provinces, and regions worldwide. These less well-known institutions are already under pressure to compete with distant institutions for students and resources formerly theirs by right of location. Often unaware of the institutions already encroaching on "their" traditional territory, mid-level institutions will need to specialize rather quickly in order to survive the next several decades. Already behind in database and other administrative services, institutions in developing nations must further reorganize their administrative and academic sectors to respond effectively to new global competitors.

Small community colleges and similar public institutions will find it difficult just to survive. In the US, "junior colleges," now called "community colleges," were established specifically to meet the needs of under serviced locales – often a county-sized region – and groups: working people and adults (non-traditional learners). However regretfully, it is difficult to imagine how these small institutions can survive in the numbers and form in which they exist now. They will almost certainly be pressured into larger units, aggregating (and reducing) their current face-to-face courses online. The SUNY Learning Network and UMassOnline (www.umassonline.net/Home.html) offer such an option now for these two large states with numerous community colleges.

Also at the periphery, we can expect to find increasing numbers of commercial institutions (like Phoenix University) with increasing commercialization of the learning space: a variety of competing LMS, learning simulations ("serious games"), student and faculty digital services, digital portfolio companies, and ubiquitous advertising of numerous products, many not learning related.

Competitive pressures on small private colleges will continue and grow. The most prestigious will flourish as social incubators for the children of elites worldwide; those less favored by reputation and endowment will either meet their competitors' online challenges or close their doors. Equally profoundly, the Café University, like the disappearing "old schools," will no longer hold a monopoly on information. Disciplinary structures provided the university with an invaluable commodity to trade with the local community. The ancient

''rights and privileges'' granted to the newly capped master, as well as to the town's parochial university, were given by the city or state in implicit exchange for access to the university's monopoly on information, information of enormous utility for the local tradesman, manufacturer, policymaker, agriculturalist and the general public. Digital languages and processes travel both ways; they penetrate the university and the community alike. The Café University already finds itself concerned as never before with service learning projects and community engagement. The new university is competing with commercial, for-profit institutions of learning, giving scant deference to the hoary traditions of the ancient academy. It is offering instead enormous flexibility and immediate access to a host of new adult learners situated globally. We can expect learners of all ages to find and aggregate their learning experiences from any connected institution, commercial or traditional, located anywhere in the world.

Faculties, as individuals, departments and disciplines will have to re-think their approach to their core responsibilities: teaching and research. Despite enormous pressure for disciplinary change, we still hover near, or at, the level of individual ''pioneers'' (Kobulnicky, 1999). To proceed from here, ICT must receive, at a minimum, some recognition in the promotion and tenure review process. To date, at most institutions, and in most disciplines, recognition is granted primarily for disciplinary research (defined in the strictest traditional terms) with evaluation of teaching performance a more subjective process. In either instance, ICT innovations or efforts have been given little, or no, acknowledgement or credit towards either promotion or tenure. Indeed, digital mastery remains for many a technical matter, not really an integral part of any particular discipline except perhaps computer science and geography.

Administrators will need to rethink the necessity for new physical structures in light of their learning purposes. Lecture halls and large lecture spaces must yield to smaller and more flexible arrangements. As students access their instructor's archived lectures, easily finding primary and secondary sources, indeed, information of all kinds, as they engage in interactive discussions from coffee houses, dorm rooms, and home, as they study abroad, talk with fellow students and scholars around the world, they will be able to maintain connection to their ''home'' institution and its programs. Computer labs with their enormous capital and maintenance costs seem far less useful than simply distributing hardware and software to students directly. Indeed, even these options will likely – and rather quickly – disappear in favor of offering entering students wireless connectivity to the web via a range of emerging mobile digital devices. We can now see an end to the enormous administrative task of scheduling synchronous classes.

For Steven Downes, an online learning guru and practitioner of radical educational deinstitutionalization, the original web, Web 1.0 was a ''reading'' web, an enormous archive from which one ''pulled'' information. Web 2.0, like its learning embodiment, eLearning 2.0, is more interactive, more expressive of human interests, needs, capacities. Web 2.0 permits users to create their own learning environment, their own portals, using search engines and software, RSS feeds for instance, to seek and bring back, ''pushing,'' any information the learner might conceivably desire. Students or faculty interested in the slave trade, for example, can easily request their own search tools, to find everything published, cited or being published (digitally) up to the very moment the request is made. The web is morphing before our eyes into a portal-driven experience, an active learner-centered, learner-controlled, digital environment; an interactive, intuitive, extension of our human capacity to acquire, classify, express and retain new information.

Ironically, the Oxbridge model was already showing the paradigmatic wear predicted by Kuhn. The emerging complex of ICT resources, however, strengthens directions long urged by progressive faculty: a student-centered, life-long learning environment. Digital tools have little value unless we harness them to the constructivist learning paradigm of the emerging global Digital University. It's not too early to declare the lecture-learning paradigm – the ancient Oxbridge model – dead, if not entirely buried.

Notes

1. Students in Africa, like much of the developing world, and among less privileged students in Europe and America, continue to arrive at institutions of higher learning computer illiterate. Resources, or the capacity to access resources, remain the single most significant obstacle to computer and digital literacy for most of the world's poor.

2. Also see Erikson's description of the new university being built in Wittenberg under the protection and patronage of the Elector of Saxony – the University where a young Martin Luther was appointed to one of two Augustinian chairs from which post he lectured for 30 years (Erikson, 1962, pp. 165-169).

3. One can find a good description of the intertwined relationship of university and locale in Andrew Taylor's biography of Gerard Mercator (Taylor, 2004, pp. 56-59).

4. Today, of course, scholars, scientists, social scientists and humanists are all (almost all) ''constructivists'' converted, or at least informed, by the once radical notions of Clifford Geertz, best seen in his seminal article ''Ideology as a social system'' and recently discussed with him in a wide ranging interview (Olson, 1991).

5. For a recent prescient and excellent consideration of many of the issues raised here (see Duderstadt *et al.*, 2005).

6. I suppose it is unnecessary to indicate that the master and the student were, for most of this tradition, men. It is fascinating to look closely at a painting of a medieval master and his students apparently painted from life in the late thirteenth century at Bologna University: the lecturers' audience is variously asleep, talking with one another and gazing everywhere but at the master http://scholar. library.csi.cuny.edu/ ~ talarico/teach.htm

7. As recently as the 1950s, Franz Boas was remembered by his colleagues as the last master of all of anthropology's diverse sub-specializations.

8. As a lecturer at the State University of New York, Plattsburgh (a relatively small public institution), I often had classes of several hundred students. At the University of the Free State in Bloemfontein, South Africa, lecture classes routinely range from the several hundreds to at least 1,200 or more in a single lecture class! It is expected that all students will not attend, but the registration process accepts these large numbers. The ''outsourcing'' of grading has also been utilized in some institutions in order to increase student enrollments, and revenue, in already over crowded lectures.

9. The work of John Dewey has undergone a revival partially due to the need of a philosophical under girding for online learning but more so due to the growing ''constructivist'' movement in higher education. See especially his classic seminal work (Dewey, 1966; Payne, 2004; Winn, 1997; Payne and Reinhart, 2004).

10. The briefest glance at Cambridge University's curricular requirements in the 1860s or Skidmore College's in the 1920s suffices to indicate the range of curricular ''requirements'' apparently believed necessary to produce an educated person in the not so distant past (University of Cambridge, 2004c; Blankman and Cannon, 1987; Lynn, 2000).

11. I have slightly modified this paragraph from an earlier published article (Reinhart, 2005).

12. While many online ventures flourished some of the more promising collapsed after considerable publicity and significant capital investment. Without writing another article, it is difficult to discover if there are pitfalls common to these closures. The most recent and perhaps most spectacular example is the quiet folding of the Alllearn Consortium, involving three of the world's leading Oxbridge model institutions: Oxford University in Great Britain, Yale and Stanford in the US, after failing to attract sufficient enrollments (MacLeod, 2006).

13. The University Without Walls program at Skidmore College is one of the few adult, external degree-granting programs of its kind at a small liberal arts college.

14. This is also the professional graduate school model pioneered by German universities in the nineteenth century and adopted first by history departments at The Johns Hopkins University, University of Wisconsin, Harvard College, Princeton, Yale, and today by essentially all of America's graduate institutions (Billington, 1973, pp. 58-66).

15. Under the leadership of Frank Mayadas and the Sloan-C consortium, the Alfred P. Sloan Foundation has pioneered the asynchronous online learning movement in the USA.

16. I wish to thank Chris Whann at UWW for his helpful comments regarding the uses of chat rooms and instant messaging.

17. Unfortunately, as Carla Payne noted correctly in reading an early draft of this manuscript, the opposite could be concluded from the current flap concerning Blackboard's patenting its LMS: an alarming effort to suppress competition, and therefore innovation. Steven Downes offers perhaps the most wide-ranging and compelling argument for a totally open, student constructed, learning portal. It was my pleasure to attend Steven's exciting, if a bit chaotic, online learning workshop at the 8th annual WWW conference, Bloemfontein, September 6, 2006.

18. These numbers are in part a positive response to older white institutions of higher learning in South Africa making a genuine attempt to bring university-level education to all the people of South Africa – white, black and colored.

19. It would require another paper to consider fully the long-standing tension between liberal arts abstraction – heuristic models – and pragmatic learning experiences such as simulations and service-learning. Dewey, of course, addressed and sought to reconcile these tensions, yet many liberal arts instructors continue to defend staunchly the primacy of theory over experience.

20. These same technologies could be extremely useful for face-to-face simulations, increasing the contacts during the year of otherwise isolated school districts, reaching out to the web for country demographics and current news.

21. As this article is being written, precisely this scenario is occurring.

22. For students growing up during the dungeons and dragons craze and to even younger learners raised on a diet of video games, avatars are familiar icons offering learners anonymity: an identity-free learning experience.

23. It would seem the greatest difficulty for instructors themselves was determining who or how to assign individuals to groups and, at term's end, evaluating the group's final product.

24. For examples see Rum, Slaves and Molasses, University Without Walls, Skidmore College, Fall 2005, online at www.skidmore.edu/uww/courses/rum Due to copyright concerns a password will have to be obtained from UWW's webmaster: pbanner@skidmore.edu

25. A note of caution, however: some administrators are already using learning objects and other digital tools to create ''templated'' courses raising authentic pedagogical concerns that faculty input and creativity can or will be marginalized or eliminated.

26. The educational implications for learning in the developing world as for all less wealthy institutions are enormous. Limited resources can now be used elsewhere for example, to hire faculty, to create ICT infrastructure and ICT training opportunities.

27. This entire topic requires a separate paper, beyond the focus here.

28. I am indebted to Dean Tienie Crous, the University of the Free State, for sharing his ideas concerning the challenges of administration during a time of considerable technological flux in higher education.

29. As the ICT revolutions in India and Ireland illustrate, a digital-web strategy for tertiary education in developing nations offers significant opportunities to make decisive changes in access to and quality of student instruction.

References

Berthier, G.F. (1752), ''L'Encyclopédie'' ou dictionnaire raisonné des sciences, des arts et des métiers, ('The ''Encyclopedia'' or systematic dictionary of the sciences, arts and crafts')'', *Journal de Trévoux*, February.

Billington, R.A. (1973), *Frederick Jackson Turner*, Oxford University Press, Oxford.

Birkerts, S. (1994), *The Gutenberg Elegies: The Fate of Reading in an Electronic Age*, Faber and Faber, Boston, MA.

Blankman, E.J. and Cannon, T.O. (1987), *The Scarlet and the Brown: A History of St Lawrence University, 1856-1981*, St Lawrence University Press, Canton, NY.

Brooke, C.N.L. (ed.) (1993), *A History of the University of Cambridge*, 4 vols., Cambridge University Press, Cambridge.

Chronicle of Higher Education (n.d.), ''Information technology'', *Chronicle of Higher Education*, Vol. 52 No. 27, p. A28, available at: http://chronicle.com

Darnton, R. (1979), *The Business of Enlightenment: A Publishing History of the Encyclopédie, 1775-1800*, Belknap-Harvard University Press, Cambridge, MA.

Dewey, J. (1966), *Democracy and Education: An Introduction to the Philosophy of Education*, The Free Press, New York, NY.

Downes, S. (2004), ''Educational blogging'', *EDUCAUSE Review*, Vol. 39 No. 5, pp. 14-26.

Duderstadt, J.J., Wulf, W.A. and Zemsky, R. (2005), ''Envisioning a transformed university'', *Issues in Science and Technology*, Vol. 22 No. 1, available at: www.issues.org/22.1/duderstadt.html

Erikson, E.H. (1962), *Young Man Luther: A Study in Psychoanalysis and History*, W.W. Norton & Co., New York, NY.

Friesen, N. (2006), ''Microlearning and (micro)didaktik'', paper presented at Micromedia and eLearning 2.0: Getting the Big Picture, June 8-9, Innsbruck, available at: http://learningspaces.org/n/papers/microdidaktik.doc (accessed October 2, 2006).

Genovese, E.D. (1969), *The World the Slaveholders Made: Two Essays in Interpretation*, Pantheon, New York, NY.

Golden, D. (2006), ''Online university enrollment soars as quality improves'', *Wall Street Journal*, p. B1, May 9.

Kobulnicky, P. (1999), ''Critical factors in information technology planning for the academy'', *Cause/Effect*, Vol. 22 No. 2, pp. 19-26.

Kuhn, T.S. (1996), *The Structure of Scientific Revolutions*, University of Chicago Press, Chicago, IL.

Lynn, M.C. (2000), *Make No Small Plans: A History of Skidmore College*, Skidmore College, Saratoga Springs, NY.

MacLeod, D. (2006), ''Oxford online learning project folds'', *Guardian*, March 20, available at: http://education.guardian.co.uk/elearning/story/0,1735137,00.html

Maehl, W.H. (2000), *Lifelong Learning at its Best: Innovative Practices in Adult Credit Programs*, Jossey-Bass Inc., San Francisco, CA.

Martin, A. (2006), ''A framework for digital literacy'', unpublished manuscript, draft version 2.5.

Naude, L. and Reinhart, C.J. (2005), *The Power of Engagement: An International Model in On-Line Service Learning*, American Association of Colleges and Universities, Providence, RI.

Nel, E. (2005), ''Creating meaningful blended learning experiences in a South African higher education classroom: an action inquiry'', unpublished PhD dissertation, University of the Free State, Bloemfontein.

Newitz, A. (2006), ''Your second life is ready'', *Popsci.com*, available at: www.popsci.com/popsci/technology/7ba1af8f3812d010vgnvcm1000004eecbccdrcrd.html (accessed September 29, 2006).

Olson, G.A. (1991), ''Clifford Geertz on ethnography and social construction'', *Journal of Advance Composition*, Vol. 11 No. 2, pp. 245-68.

Pannabecker, J.R. (1994), ''Diderot, the mechanical arts, and the encyclopédie: in search of the heritage of technology education'', *Journal of Technology Education*, Vol. 6 No. 1.

Pannabecker, J.R. (1996), ''Diderot, rousseau, and the mechanical arts: disciplines, systems, and social context'', *Journal of Industrial Teacher Education*, Vol. 33 No. 4, available at: http://scholar.lib.vt.edu/ejournals/JITE/v33n4/jite-v33n4.pannabecker.html

Payne, C.R. (2004), ''Design for success: applying progressive educational principles online'', in Vrasidas, C. and Glass, G. (Eds), *Online Professional Development for Teachers*, Information Age Publishing, Greenwich, CT.

Payne, C. and Reinhart, C.J. (2004), ''Assessing asynchronous discussions'', Adult Higher Education Alliance Conference, Long Beach, CA.

Rashdall, H. (1936), *The Universities of Europe in the Middle Ages*, Oxford University Press, Oxford.

Reinhart, C.J. (1998), ''Learning and teaching at a distance – teaching on-line: America in the Sixties'', *Journal of Asynchronous Learning Networks*, Vol. 2 No. 1, available at: www.aln.org/alnweb/magazine/maga_v2_i1.htm

Reinhart, C.J. (2005), ''The liberal arts ideal in an asynchronous age'', *Elements of Quality Online Education: Into the Mainstream: Wisdom from the Sloan Consortium*, available at: www.aln.org/publications/books/wisdom.asp

Romano, L. (2006), *Washington Post*, May 16, available at: www.washingtonpost.com/wp-dyn/content/article/2006/05/15/AR2006051501496.html

Sax, B. (2006), ''Knowledge and wisdom in academia'', unpublished manuscript, draft version 1.

Spicer, D. (2006), ''Sloan-C List serve'', available at: http://news.bbc.co.uk/2/hi/uk_news/england/west_yorkshire/5013194.stm

Suchman, L. (1987), *Plans and Situated Actions: The Problem of Human Machine Communication*, Cambridge University Press, Cambridge.

Suchman, L. (2003), ''Writing and reading: a response to comments on plans and situated actions'', *Journal of the Learning Sciences*, Vol. 12 No. 2, pp. 299-306.

Taylor, A. (2004), *The World of Gerard Mercator: the Mapmaker who Revolutionised Geography*, Harper Perennial, London.

Thomas, K. (2006), ''Learner perspectives on the use of a learning management system in first-year economics'', unpublished PhD dissertation, University of Pretoria, Pretoria.

University of Cambridge (2004a), ''A brief history'', available at: www.cam.ac.uk/cambuniv/pubs/history/setting.html (accessed 2006).

University of Cambridge (2004b), ''The medieval university'', available at: www.cam.ac.uk/cambuniv/pubs/history/medieval.html (accessed 2006).

University of Cambridge (2004c), ''The revived university of the nineteenth and twentieth centuries'', available at: www.cam.ac.uk/cambuniv/pubs/history/19c.html (accessed 2006).

Winn, W. (1997), ''Learning in hyperspace'', available at: www.umuc.edu/ide/potentialweb97/winn.html (accessed 2005).

von Humboldt, W. (1963), *Humanist without Portfolio: An Anthology of the Writings of Wilhelm von Humboldt*, Wayne State UP, Detroit, MI.

Further reading

Cooper, P.A. (1993), ''Paradigm shifts in designing instruction: from behaviorism to cognitivism to constructivism'', *Educational Technology*, Vol. 33 No. 5, pp. 12-19.

Dunn, R.S. (1972), *Sugar and Slaves: the Rise of the Planter Class in the English West Indies 1624-1713*, University of North Carolina Press, Chapel Hill, NC.

Geertz, C. (1964), ''Ideology as a social system'', in Apter, D. (Ed.), *Ideology and Discontent*, Free Press, New York, NY, pp. 47-76.

Gilbert, L. and Moore, D.L. (1998), ''Building interactivity into web courses: tools for social and instructional interaction'', *Education Technology*, Vol. 38 No. 3, pp. 29-35.

Janicki, T.L. and Liegle, J.O. (2001), ''Development and evaluation of a framework for creating web based learning modules: a pedagogical and systems approach'', *Journal of Asynchronous Learning Networks*, Vol. 5 No. 1.

Le Grange, L. (2004), ''E-learning: some critical thoughts'', *South African Journal of Higher Education*, Vol. 18 No. 1, pp. 87-97.

Palloff, R.M. and Pratt, K. (1999), *Building Learning Communities in Cyberspace*, Jossey-Bass, San Francisco, CA.

Pannabecker, J.R. (1992), ''Printing technology in the encyclopédie: constructing systematic knowledge'', *Journal of Industrial Teacher Education*, Vol. 29 No. 4, pp. 73-91.

Reinhart, C.J. (2006), ''Windward in an asynchronous world, the Antiguan initiative: unanticipated pleasures of the distance learning revolution'', in Martin, A. and Madigan, D. (Eds), *Learning in the Digital Age*, Facet Publishing, London.

Rothman, D. (1971), *The Discovery of the Asylum*, Little, Brown & Company, Boston, MA.

Schement, J.R. and Curtis, T. (1997), *Tendencies and Tensions of the Information Age: The Production and Distribution of Information*, Transaction Publishers, New Brunswick, NJ.

Siklos, R. (2006), ''A virtual world but real money'', *The New York Times*, October 19, C1.

Street, B. (1987), ''Models of computer literacy'', in Finnegan, R., Salaman, G. and Thompson, K. (Eds), *Information Technology: Social Issues*, Hodder & Stoughton, London, pp. 33-7.

Street, B. (1995), *Social Literacies*, Longman, London.

Street, B. (2001), ''Contexts for literacy work: the ''new orders'' and the ''new literacy studies''', in Tett, L., Hamilton, M. and Crowther, J. (Eds), *Powerful Literacies*, NIACE Publications, Leicester, pp. 13-22.

Strijbos, J.W., Martens, R.L. and Jochems, W.M.G. (2004), ''Designing for interaction: six steps to designing computer-supported group-based learning'', *Computers and Education*, Vol. 42 No. 4, pp. 403-24.

Thorndike, L. (1944), *University Records and Life in the Middle Ages*, Columbia University Press, New York, NY.

Udas, K. and Feldstein, M. (2006), ''Apples to Apples: guidelines for comparative evaluation of proprietary and open educational technology systems'', *Observatory on Borderless Higher Education*, May, available at: www.obhe.ac.uk/products/reports/

About the author

Cornel ''Corky'' Reinhart is the former Director of the University Without Walls program at Skidmore College, Saratoga Springs, NY (1996-2005) and an American social historian. Dr Reinhart founded Skidmore College's University Without Walls' online distance program for adult learners. Corky offered UWW's first on-line course: ''America in the Sixties'' and co-facilitated Skidmore College's faculty workshop: ''Putting Your Course On-Line.'' Presently, Corky is an international consultant assisting educators with the architecture and pedagogy of learning online. Dr Reinhart has shared his work at numerous conferences and is a past-President of the Adult Higher Education Alliance (www.ahea.org). Cornel Reinhart can be contacted at: corkyreinhart@gmail.com