Rethinking Teaching for the Knowledge Society

Diana Laurillard

For over a decade now, universities have been aware of the pressures to expand access to higher education.[1] The knowledge society needs more graduates, and those graduates will keep returning to study as lifelong learning takes its place in both work and leisure time. These are the positive pressures for expansion. But the knowledge society, fueled by the expanding higher education sector, is in turn generating more knowledge industries, producing additional, competitive pressures for traditional institutions of higher education. Those involved in university teaching in this digital age must cope with the fact that the knowledge industries are creating the means by which individuals can acquire the immediate skills and knowledge those industries need. As a result, many individuals are questioning the true benefit of a university education, given its cost.

Universities wishing to respond to these new demands need to answer two difficult questions:

- *How should the curriculum balance expert knowledge and practitioner knowledge?* Universities are comfortable teaching specialist knowledge produced by experts, but practitioner knowledge and the skill to develop it, which is what the knowledge industry needs, is not a natural part of university curricula. Should universities move into this area at the undergraduate level, as Michael Gibbons and others suggest,[2] or should they leave it to the post-graduate, post-experience programs within the private sector?
- *To what extent is a degree course a long-term grounding for an individual?* A degree certifies the knowledge that graduates have developed when they leave a university, but most graduates use very little of this knowledge in their subsequent careers. The more enduring qualities gained are the skills, attitudes, and ways of thinking derived from courses. But degrees and syllabuses are still defined in terms of subject knowledge, rather than generic skills. Should universities focus courses and teaching more on the practice of high-level skills, or should they leave this to individuals to develop through subsequent work in the knowledge industries?

To answer these questions, we must be able to define what distinguishes a university education from the knowledge in-

dustries' offerings in the form of corporate and "for-profit" institutions.

In 1997, Lord Dearing's National Committee of Inquiry into Higher Education reviewed the role of higher education "in a learning society"[3] and defined it as having four main purposes:

1. Inspiring and enabling individuals to develop their capabilities to the highest levels
2. Increasing knowledge and understanding
3. Serving the needs of the economy
4. Shaping a democratic and civilized society

The first purpose testifies to the university's commitment to the long-term personal development of the individual, in contrast with the focus on the short-term employment needs inevitably driving other forms of post-school education, such as corporate training programs. The second purpose links the twin activities of research and teaching in the development and dissemination of knowledge. The third expresses the economic value of this research and teaching, and the fourth emphasizes the cultural value to the society it serves. For the individual, therefore, universities bring together research and teaching, and a focus on long-term needs, to offer a clear competitive advantage over what the knowledge industry can provide.

The Committee defined the unique role of the university in society, embracing these four purposes, as being "to enable society to maintain an independent understanding of itself and its world."[4] Each word in that definition was carefully chosen.

- "Society" does not confine the university's role to service of the nation-state. This is one of the key changes now in the way that universities relate to their context: once an organ of the nation-state, a university now crosses national boundaries in teaching, in the way it has always done in research. "Society" also implies that the understanding is widely owned, fully disseminated, not located with some elite but with society itself, thereby enabling it to become, in the fullest sense, a learning society.
- "Maintain" suggests a continuing responsibility, but one that is responsive to change because of what is being maintained: an understanding of society itself, in continual flux, and of its world, for which our theories are in continual development.
- "Independent" refers to the unique position of universities as creators of understanding. There will be many claimants for the role of understanding our society and its world in the new "knowledge society," but most of them—the media, industrial research units, corporate universities—cannot claim independence from political and commercial interest. The individualistic and disinterested nature of university research and teaching remains unique.
- "Understanding" expresses the epistemology of a university as knowledge acquired with a sense of responsibility for how it comes to be known and with the purpose of enabling enhanced action.

- "Of itself and its world" is inclusive of the full range of the natural, human, and social worlds as objects of understanding.

This portmanteau definition helps to clarify the unique role of universities for society as a whole. They are distinguished from plausible competitors in the knowledge industries by their universality of scope, by their independence of inquiry, and by the nature of their epistemology. Therefore, I conclude this section with the following proposition:

Proposition 1: Universities will maintain their competitive edge against the knowledge industries through the maintenance of their core values—including research-based teaching and a curriculum that provides for the long-term cognitive needs of individuals.

Does University Teaching Measure Up to Its Role?

The rhetoric is good, but saying doesn't make it so. Whenever senior academics are rattled by the pretensions of the private upstarts in the corporate education business, they incline to the view that the degree-awarding powers of universities protect the uniqueness of their institutions. At present, this is perhaps true, but governments have the ability to change that power if universities are not seen to provide something valued and something distinctive from the increasing offers of the private sector.

For some time now, academics have been arguing for a radical shift from the standard transmission model of university teaching. Donald A. Schön, for example, demonstrated the need for a "reflective practicum" in universities, where students can prepare for their future careers when existing professional knowledge will not fit every case. Practitioners have to make sense of uncertain, unique, or conflicted situations of practice through "reflection-in-action," and they need to be able to go beyond the rules—devising new methods of reasoning, strategies of action, and ways of framing problems. This presupposes a very different kind of university teaching:

> Designing, in the broader sense in which all professional practice is design-like, must be learned by doing. A design-like practice is learnable, but is not teachable by classroom methods . . . the interventions most useful to students are more like coaching than teaching, as in a reflective practicum. . . . The reflective practicum demands intensity and duration far beyond the normal requirements of a course. . . . A studio, a supervision, an apprenticeship. . . . Students do not so much attend these events as live in them. And the work takes time . . . time to live through the learning cycles involved in any design-like task; and time to shift repeatedly back and forth between reflection on and in action.[5]

Similarly, Etienne Wenger's account of a "learning community" emphasizes the importance of individual and community

engagement in several ways.[6] For the acquisition of knowledge, the community must provide three kinds of engagement:

- Give newcomers access to competence
- Invite a personal experience of engagement
- Enable incorporation of competence within participation

For the creation of knowledge, four further types of engagement are required:

- Radically new insights
- Mutual engagement around joint enterprise
- Strong bond of communal competence
- Deep respect for particularity of experience

Wenger's account does not privilege universities with unique access to such characteristics; the knowledge industries are likely to develop these traits as well, if they are to succeed. But universities will need graduates capable of contributing to the more fluid kind of knowledge creation that is needed by the professional practitioner, who is not confined to the well-trodden paths of expert consensus knowledge of the traditional university curriculum. Students' long-term cognitive needs go well beyond the acquisition of consensus knowledge.

There are significant opposing pressures on universities—to demonstrate research success on the one hand and to provide for wider participation in higher education on the other. The two pressures oppose because research and teaching are seen

to be in competition with each other, at the institutional level and at the individual level. In the United Kingdom, significant funding follows high research ratings, whereas funding for teaching is not related to quality ratings, so institutions reward good research more than good teaching. Academics have to divide their time between the two activities: the one in which they are professionally qualified and judged by their peers; the other in which they are neither qualified nor judged. Inevitably, research wins. There have been attempts to ignite academics' interest in the professional accreditation of teaching—for example, by setting up the Institute for Learning and Teaching in the United Kingdom—but interest is minimal; we are not yet on a transformational path.

Proposition 2: Universities are not maintaining a professional teaching approach that parallels their professional research approach, and the curriculum is not sufficiently oriented toward long-term high-level cognitive skills.

What Are the Challenges to University Teaching?

Our teaching methods have not evolved sufficiently to keep pace with what is needed. The dominant model is still the transmission model, with the dominant learning technologies still being those it has spawned: the lecture, the book, the marked assignment. Academics have been under such pressure

to meet research demands and teach larger numbers of students that they have been unable to go beyond the traditional forms of academic teaching. We have begun at last to play with digital technologies as a way of meeting the demands of the digital age, but with an approach still born of the transmission model. The academic community has not redefined what counts as "higher learning" and therefore cannot draft the specification for how the new technology should do anything other than what learning technology has always done: transmit the academic's knowledge to the student. The academic world has called each new technological device—word processing, interactive video, hypertext, multimedia, the Web— into the service of the transmission model of learning. The potential of the technology to serve a different kind of learning cannot be exploited by an academic community that clings only to what it knows. The academy, with respect to the professional practice of teaching, is not a reflective practicum. There is no progress, therefore, in how we teach, despite what might be possible with the new technology.

What is the difference between a curriculum that teaches what is known and one that teaches how to come to know? Knowledge, even academic knowledge, is not adequately represented as propositional statements but has a historicity that incorporates individuals' previous experiences, their perceptions of the immediate situation, their intentions, and their experiences of discovery, of recognized tensions, of uncertainties, of ambiguities still unresolved. This is not situated learning only, nor discovery learning, nor meta-learning. It comes closer to

scholarship as learning. It requires a reflective practicum for the learning process. But for that to be possible, university teachers have to renew and develop their model of the learning process well beyond the traditional transmission model. It requires a teaching approach that turns academics themselves into reflective practitioners with respect to their teaching. In the context of research, of course, they would certainly describe themselves as reflective practitioners. As researchers, they are consummate professionals who are

1. fully trained through an apprenticeship program, giving them access to competence and personal engagement with the skills of scholarship in their field;
2. highly knowledgeable in some specialist area;
3. licensed to practice as both practitioner and mentor to others in the field;
4. building on the work of others in their field whenever they begin new work;
5. conducting practical work using the agreed-upon protocols and standards of evidence of their field;
6. working in collaborative teams of respected peers;
7. seeking new insights and ways of rethinking their field; and
8. disseminating findings for peer review and use by others.

In the context of research, academics measure up well to Schön's and Wenger's ideals. Now run through the above list again and consider the characteristics in the context of univer-

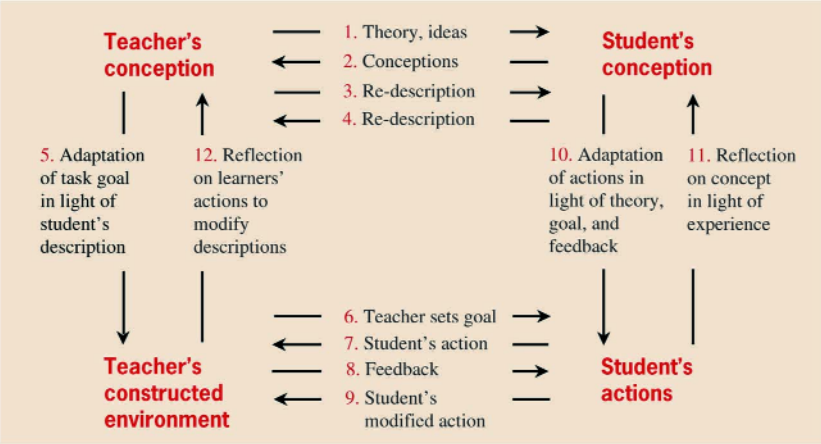
sity teaching. How many of those eight characteristics of the reflective practitioner contributing to a learning community typically apply to the academic as teacher of his or her subject? None, not even number 2, since in this context we should refer to a specialism in the *pedagogy of the subject*, not relying simply on academic knowledge. It is tough for academics who are under pressure to address this as an aspect of their professionalism, but if there is to be innovation and change in university teaching—as the new technology requires, as the knowledge industry requires, and as students demand—then it follows that academics must become researchers in teaching.

Proposition 3: University teaching must aspire to a realignment of research and teaching and to teaching methods that support students in the generic skills of scholarship, not the mere acquisition of knowledge.

What Is Possible?

I have argued elsewhere that a "Conversational Framework" for learning offers a more progressive model than the transmission model and is more compatible with the requirements of the reflective practicum to which we must aspire.[7] It fits the ideal of university education, which is what academics certainly aspire to, for all that they do not practice it. And it provides a framework against which we can specify what the digital technologies should be doing to support this more elaborate

Figure 1



model. It captures the essence of university teaching as an iterative dialogue between teacher and student(s), operating on two levels: (1) the discursive, theoretical, conceptual level and (2) the active, practical, experiential level—the two levels bridged by each participant engaging in the processes of adaptation (practice in relation to theory) and reflection (theory in the light of practice).

The iterative dialogue of the Conversational Framework is expressed as a diagram in Figure 1, against which we can test a range of different kinds of learning technology.

The Conversational Framework describes the irreducible minimum for academic learning. The interplay between theory and practice is essential for "making the abstract concrete," as Mitchel Resnick put it.[8] And the continually iterative dialogue between teacher and students is essential if the students are to

be sure that they have understood the teacher's concept. The transmission model—the expression of the teacher's concept—is just one part of a much more complex model for learning as shared understanding.

Taking these dialogic activities as the criteria for the reflective practicum and the learning community, we can test how well some of the more ambitious uses of the technology measure up to these requirements. To what extent can a particular ICT (Information and Communication Technologies) format support the full Conversational Framework? We can immediately see that many of the more ubiquitous forms offer no more than the traditional print and lecture presentational media, which serve only the transmission activity. Lecture notes on the Web and CD-based digital resources are two examples. However, if we exploit the communicative and adaptive capabilities of new technologies in carefully integrated combinations, they can meet the requirements of most of the activities in the Conversational Framework. Then they can transform the learning experience into one that fits better with the requirements of the digital age.

Different learning technology models cover different combinations of activities within the Framework. When sufficient design time is given to challenging the technology to meet these more progressive academic ideals, something more than "lecture notes on the Web" is possible. Design has to be generated from the learning objectives and the aspirations of the course, rather than from the capability of the technology. Courses at the Open University have provided several opportu-

nities for exploiting the technology in the service of specific types of learning activity in which students need to engage. Examples are shown in Figures 2 to 6. In each case, the communicative, interactive, and adaptive capabilities of the technology facilitate different kinds of iterative dialogue between teachers and students. The practical exercises of investigating and analyzing resources and running simulations are combined with theoretical and conceptual discussions within the community, either synchronously or asynchronously.

Figure 2 shows a complex environment of "reservoirs" through which a carbon atom moves via a transformational process such as "burning—from land plants to atmosphere" or "absorption—from atmosphere to sea." The task goal is to move the atom through all twelve reservoirs in the environment. The action is to select a suitable next reservoir and its appropriate process. There is feedback in the form of successful transition, video clips of each process in action, and a record of reservoirs as yet unvisited. In its generic form, the objective being met here is to learn the sequence and transformational processes within a cyclical system. The same pedagogic form could be used for quite different content, such as the osmosis cycle or the development of an individual.

Figure 2

Figure 3 shows the beginning of an environment for investigating relationships between literary resources from the Homeric poems and artifacts from archaeological sites of ancient Greece. Each week of work defines a set of investigation activities, such as "compare the mortal characters in the *Iliad* and the *Odyssey*" and "investigate the kind of society in Mycenae." Students use search facilities through the digitized resources, guided by advice on what to look for and how much material to use. They use a notepad facility to take notes on what they find, and once sufficient notes have been collected, they can consult model answers. Using these, they may then continue their search or refine their notes. Again, this pedagogic form could be applied to any other digitized content, with the teacher supplying some appropriate investigation activities and matching model answers.

Figure 3

Figure 4 shows the form of an online asynchronous reading group. Students can read the article supplied and may comment on it using a comment button to link to a discussion threaded around the structure of the article and around some key questions defined by the tutor. The teacher must supply the text, define the key questions, and contribute to the discussion.

Figure 4

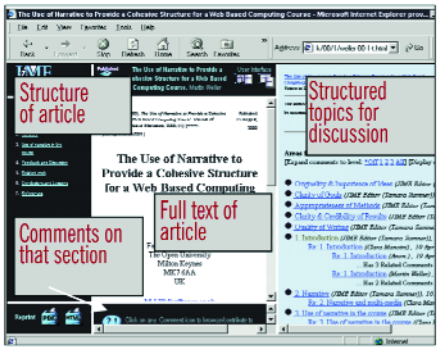


Figure 5 shows the same environment adapted to discussion of a runnable simulation. This format combines both the communicative and the adaptive capabilities of learning technology. The teacher supplies the simulation model and the task goal—for example, find the optimal parameters for these conditions—and the interactive model provides the feedback to

Figure 5

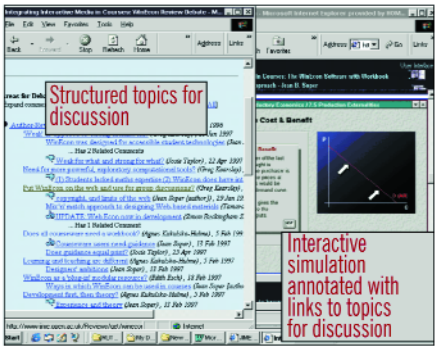
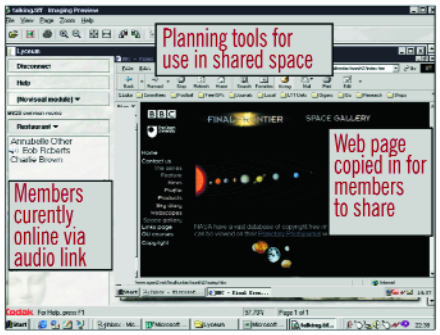


Figure 6



the student. The student can use the comment button to link to a discussion threaded around the structure of the simulation or the task. The format here allows iterative dialogue at the conceptual level and interactive experimentation at the practical level.

Figure 6 shows a synchronous discussion environment around a shared visual space. Students use a headset, and both audio and data are transmitted via a single modem, using audio on the Web. Students or tutors may submit anything, including a text, diagram, or picture (in this case, a Web site), to the shared space and may use the tools on offer for collaborative design—for example, a concept-mapping tool. The teacher may specify the form of the group, the task, and the visuals.

The practice of high-level cognitive skills can be supported through these more radical design formats for learning technologies. Each of these addresses most of the activities in the Conversational Framework and therefore supports a more

complex learning experience than print, or lectures, or simple Web pages. We need to be able to offer this more elaborate kind of learning experience on a mass basis. Technology is capable of doing that, since it is essentially a mass-oriented device. But it cannot do so unless academics find a way to use this new tool more effectively.

> *Proposition 4*: Learning technologies can support students in the learning forms that contribute to the high-level cognitive skills of scholarship and the practitioner-based skills and knowledge of design-like practice.

How Might This Change Be Realized?

Designing learning technology models that are innovative and effective, that exploit the new technology, and that address the expectations of the knowledge industry is an additional burden for academics. How can this be done?

The problem is that teaching does not invent its tools; it uses those invented by others. The academy had language but didn't invent writing—traders did that. It had writing but didn't invent books—administrators did that. It didn't invent computers—engineers did that. It didn't invent the Internet—the military did that. It did invent the Web, but not for teaching purposes. All those technologies have been adopted by the teaching professions but only in the service of the transmission model of learning. We have to conclude that it is not a natural

part of the process of teaching for its practitioners to invent tools for the improvement of practice.

There is an alternative approach to the individual struggling to discover how best to use a complex technology. All technologies create communities that invent a range of formats within which practitioners can craft a variety of contents: different types of books, television programs, PC applications. We need the same formats for learning technologies. But these devices grow organically. They are not designed in the abstract, as were, say, authoring systems. They begin life in the excitement of creativity and the intention of doing something different. That is how new teaching designs should begin, and that is how all the above examples began. But the new designs should not stay rooted in the particularity of the original design. The beauty of computer programs is that they can endure as a form, as a tool for others to design by. So the program that began as a way of enlivening the study of Homer could be generalized to become a tool for enabling students to undertake guided investigations of a range of resource materials in order to develop their own analyses of each investigation. And as a design tool, it then becomes usable by academics in the same way that a book format or a small-group format can be. Similarly, the program that began as a way of challenging students to drive a carbon atom through its stages of transition between different reservoirs could become a tool that other academics customize for quite different content, while preserving the form of identifying appropriate transition processes in a dynamic system. The form of the learning activity, already tested

and proven, remains the same. The content may cover a wide range of different topics.

There will be many such forms—possibly hundreds across the full range of the university curricula. These could be adapted to a generic form to provide design tools for academics to use in their teaching much as they currently use PowerPoint for presentations. As we have seen, each of the programs in Figures 2 to 5 could offer a generic learning activity model:

- An exercise on identifying the process changes that an object must go through in moving from one context to another
- A guided investigation and analysis of the relations between digitized source materials, with model answers as feedback
- A digital-document discussion environment for any text or article, offering discussion around the structure of the article and defined general topics
- A digital-document discussion environment for a runnable simulation, offering discussion around the structure of the simulation and defined general topics
- A synchronous discussion environment for a small group talking around a set of shared resources

In each case, teachers must provide the content and ideas appropriate for the particular learning activities that they want to design, as they do for the generic form of a book, a lecture, or a PowerPoint presentation for less active forms of learning.

They need relatively little programmer support. The pedagogical design is already embedded in the generic form. It is the teachers' design task to customize the content. In such a way, we should also be able to capture the generic forms that facilitate the culture of inquiry and professional practice.

The proposal that academics could become professionals in the sense of being reflective practitioners in the pedagogy of their subject is now more feasible. A generic learning activity model (GLAM)[9] embodies good pedagogic practice from the original design and evaluation process, enabling professionals to share ideas and build on each other's work. This is the beginning of the kind of collective R&D program we will need to generate innovative and effective teaching. If the OKI (Open Knowledge Initiative) led by MIT can function as a knowledge-building community, defining the design standards of good pedagogy in the use of learning technologies, then we will really have a reflective practicum for teaching.

Proposition 5: Academics need a collective R&D program that builds design tools, or generic learning activity models (GLAMs), for supporting students in learning the skills of scholarship.

Would academics accept such a program? Perhaps. Academics, like all other professionals, work to the system in which they find themselves. If universities facilitated and rewarded a highly professional approach to teaching, academics would respond. Without such facilitation and reward, they will respond

to what the system *does* reward, namely a professional approach to research only.

Proposition 6: Universities must support a professional teaching approach that mirrors the approach for research.

A New Approach to University Teaching?

If adopted, Propositions 5 and 6 would constitute a new approach to university teaching. The technology can do only so much. On its own, it cannot offer academics what they need to adapt their teaching to the needs of the digital age. With this new approach, however, they would be able to do more. For this approach to be successful, there has to be a common understanding of the nature of learning at the university level, an acceptance that teachers must become reflective practitioners, and an intention by university management to create the conditions that foster and reward this rather different approach. Without a change in approach, new technology will not serve universities in meeting the challenge of mass higher education and lifelong learning for the knowledge society. The digital age will find its own ways of managing without us.

ACKNOWLEDGMENTS

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NOTES

1. The word *university* is used generically here to refer to colleges, universities, and other traditional, nonprofit forms of higher education.

2. Michael Gibbons et al., *The New Production of Knowledge: The Dynamics of Science and Research in Contemporary Societies* (London: Sage Publications, 1994).

3. *Higher Education in the Learning Society: Report of the National Committee of Inquiry into Higher Education* (Great Britain: National Committee of Inquiry into Higher Education, 1997).

4. Ibid., 72.

5. Donald A. Schön, *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions* (San Francisco: Jossey-Bass, 1987), 157, 311.

6. Etienne Wenger, *Communities of Practice: Learning, Meaning, and Identity* (Cambridge: Cambridge University Press, 1998).

7. Diana Laurillard, *Rethinking University Teaching: A Conversational Framework for the Effective Use of Learning Technologies*, 2nd ed. (London: RoutledgeFalmer, 2002).

8. Mitchel Resnick, "Lifelong Kindergarten," presentation deliv-

ered at the annual symposium of the Forum for the Future of Higher Education, Aspen, Colorado, September 2001.

9. GLAM is not an attractive acronym. Using the word *design* instead of *model* forms the acronym GLAD, which is no better. Substituting *customizable* for *generic* gives CLAM, which has all the wrong connotations. There must be a better way of putting this.

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