Beyond Institutional Boundaries: reusable learning objects for multi-professional education

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"The exciting discontinuity, the exciting opportunity and threat, the exciting confusion now thrust upon us is an explosion of new ways of organizing, communicating, delivering, finding, modifying, and creating information. We have barely begun to see how to use these new ways for teaching and learning. It will take many decades to invent and wring out the very best uses of these new tools – even as newer tools continue to arrive, divert our attention, and offer ever greater possibilities." (Gilbert, 2000)

Background:

In early 2002 a number of UK Medical Schools and Schools of Nursing founded a collaborative project to produce a bank of high quality e-learning resources or 'reusable learning objects' (RLOs) to support and enhance teaching in the traditionally difficult areas of statistics, epidemiology and research skills. Creation of these resources is very costly; typically amounting to more than one institution can afford to fund. Yet many of these resources are generic and can be used, re-used and shared between institutions and across disciplines. So the Universities' Collaboration in Elearning' (UCEL)[1] was founded to create, develop and share these resources. Historically, the early uses of computer-aided learning were to develop entire courses (either on the web or CD-ROM). This led to a monolithic approach with large, unwieldy and rigidly fixed slabs of learning making it very difficult for anyone else to incorporate the materials into their teaching; effectively, either the whole course had to be used, or none of it. Such a course is the Medical Sociology Interactive[2] course, now in it's third year at Cambridge. Although the course has been deemed very successful, and student evaluations show that they perceive it to be of high value (Leeder & Davies, 2001) because it is an entire course, other lecturers have found it difficult to incorporate it into their own teaching practice. This (quite understandable) resistance typifies the 'not-invented here syndrome'. So a method of overcoming this needed to be found and one solution was to disaggregate the course into its component parts. Draper (2000) suggested resource based learning in the form of 'atoms' and collaborative processes to create and share these resources.

Current e-learning practice is consequently moving away from courses and more towards the resources that actually form the components of those courses (Wiley et al, 2000; Harden & Hart, 2002). RLOs present a number of educational advantages compared with more traditional course-based approaches. Because they are stand-alone resources that encompass a single "chunk" of learning, they can be used in many different ways and across disciplines. This makes them extremely flexible and cost-effective. Students and teachers alike have access to these resources at any time or place through a standard web-browser. Teachers can combine various RLOs to form the basis for their own custom-made courses or they can direct students to

[1] http://www.medgraphics.cam.ac.uk/ucel/
[2] http://www.medgraphics.cam.ac.uk/medsoc/

individual RLOs to support or explain a particular concept or process. Material can be kept up to date more readily: it's much easier to update a single resource than an entire course.

So what then, is a reusable learning object? How might one be defined and what appearance would it have? Here is a definition: "A reusable learning object (RLO) is a digital resource based on a single learning objective, comprising a stand-alone collection of four components: 1. Presentation: a presentation of the concept, fact, process, principle or procedure to be understood by the learner in order to support the learning objective; 2. Activity: something the learner must do to engage with the content in order to better understand it; 3. Assessment: a way in which the learner can apply their understanding and test their mastery of the content; 4. Links: external resources to reinforce the taught concept and support the learning objective". This pragmatic, somewhat utilitarian UCEL model of an RLO (Leeder et al, 2002) is based on a more general definition of 'a digital resource that can be reused to facilitate learning' (Wiley, 2001) with echoes of the CISCO Reusable Learning Object Strategy (Barritt & Lewis, 2000) which contains a further sub-level of Reusable Information Objects: the building bricks of RLOs. Collaborators are encouraged to create their own RLOs using a template, a simple document composed of a number of fields containing either metadata (the data describing the RLO) or the RLO itself (presentation, activity, assessment, links). These 'RLO specifications' are then transformed into interactive resources by a multimedia developer. This, inevitably, is a labour intensive and expensive process, yet it is recognised that rich multimedia coupled with high production values has enormous power to engage the learner and aid understanding (Edelson & Pittman, 2001). Therefore the more sharable, reusable and repurposable these resources can be, the wider their uptake and the better value for money they will represent.

Nursing Perspective

Nursing represents one of the largest subject areas in Higher Education and current health policy is forcing curriculum planners to look for innovative and flexible approaches to delivery of pre-registration and post-registration programmes. There are in excess of 70,000 students enrolled on nursing programmes in over 70 universities and colleges (QAA, 2001). This is likely to increase with the plans contained in 'Delivering the NHS plan next steps on investment, next steps on reform' (DOH, 2002) for 35,000 more nurses, midwives and health visitors by 2008. E-learning resources and e-learning communities, if used appropriately could be used, not to replace nurse educators, but to help them to 'work smarter'. Many schools of nursing and the therapies have created online modules or courses or are planning them (Anthony, 2001a, 2001b). Entire courses or modules are often not appropriate for re-use in different institutions this, coupled with the cost of developing these materials, adds up to considerable repetition of effort and inefficiency. A collaborative approach to produce and share resources would seem to be the answer.

The boundaries that traditionally defined the roles and responsibilities of health professionals are blurring for example, the 'extended roles' of nurses exemplified by nurse consultant posts and nurse prescribing roles. The greying of traditional professional role boundaries and multiprofessional team working has been further encouraged by the success of health professional collaboration shown in primary care teams and various care in the community initiatives. These implementations and the increasing input on curriculum design and delivery offered by employers in response to greater control of funding by the workforce confederations,

are driving the most recent multiprofessional education movement in higher education institutions. Few would argue with the potential benefits of multiprofessional or shared learning. Fostering understanding and respect between the respective health professionals early in their education as well as limiting prejudices that may exist leads to improved team work, recognition of what each health professional brings that is different and a potentially more powerful collaboration (Davies, 2000). Zwarenstein & Reeves (2000) point out that collaboration between doctors and nurses leads to a positive impact on patient outcomes.

Shared learning amongst healthcare students has been on the education agenda before, being largely driven then by rationalising the use of resources, widening student choice and enlarging market share (Barr, 1994). In this context there are accounts of nursing cohorts joining lecture courses designed for medical or biology students (Chapple et al, 1993; Wharrad et al, 1994). Clearly this rationalises the use of resources – the lecturer, lecture preparation time, lecture theatre time but often the needs of the students particularly the minority group were not being met. Lectures cannot foster team working and interactivity between different groups of students in the same way as small group sessions such as skills workshops and problem based learning tutorials. Although Shaw (1995) rightly points out when considering shared learning one needs to distinguish between 'acquisition of information' (and the potential for sharing common resources) and 'interactive learning' that encourages learning about others. However it is worth pointing out that even when shared learning means attending the same lectures or using common resources, it is still raising awareness of what other health professionals are studying: As one nurse student put it "it's good to know that you are getting as much information as the medical students" (Chapple et al, 1993, page 431).

A range of subjects have been identified as being suitable for multiprofessional learning including health promotion, communication skills, study skills and research methods (Tope, 1996). When designing course materials for multiprofessional learning other considerations are previous education and experience of the group, level of study, specific relevance to each individual profession and so on. The development of electronic, re-usable learning resources representing smaller elements of learning that can be selected (by searching a database for particular tags) to address the specific learning needs of different multi-professional groups rationalises the use of lecturers' time in preparing common material. The context in which they are used within modules and courses then provides the flexibility and relevance for individual professional groups overcoming many of the oft quoted organisational difficulties such as incompatible timetables, placements and lack of appropriate sized teaching rooms.

The nursing profession has always been well represented in multiprofessional learning in both pre-registration and post registration education. A survey by Barr & Waterton (1996) found that community nursing groups made up the largest category of participants and Owens et al (1999) who carried out a postal survey showed the greatest percentage of participants were nursing professionals of various kinds. Barr (2002) in an extensive review of multiprofessional learning commissioned by the Learning and Teaching Support Centre for Health Sciences and Practice said ' it is a mark of maturity that social work, nursing and midwifery and the allied health professions are now engaged in the wider interprofessional education movement' (pg 10). The involvement of nursing in the multiprofessional UCEL collaboration is another example. As for medicine and other health related courses, research skills are a major component of nursing

curricula particularly at degree, masters and doctorate levels. Evidence based practice in diploma and post registration nursing courses also involves the development of some basic research skills. The scope for expanding the collaboration to include other nursing institutions who have or would like to embrace the pedagogical advantages of e-learning combined with a multiprofessional approach is potentially enormous.

Medical perspective

The problems facing medical education in Britain are the results of rapid technical and social change. Judging by the number of papers published[3] (MEDLINE, 2002), acquisition of medical knowledge is accelerating rapidly, and although understanding does not seem to advance as quickly, it is nevertheless credible that what a medical student might be expected to learn far exceeds what he or she is reasonably able to learn (Towle, 1998). If we consider that medical students start the process at 19, and achieve an established position at 35, much of the knowledge they started with is either outdated or has a different interpretation at the end of the process. Social changes have increasingly required newly qualified doctors to be kind and understanding, good communicators, ethically pure, good managers and to carry a very large burden of responsibility and duty (GMC, 2002). In return, it could be argued, they are afforded a high degree of social status and esteem.

One response has been to try and reduce the workload, but given the increase in the necessary knowledge, it has resulted not in less work, but in a broader range being acquired within the same work capacity (DOH, 2001). Equally, it is realised that learning must be lifelong even in the most proficient and the problem is how to reconcile this with the need to perform day-to-day work (FPHM, 2002). Another response is to experiment with different methods of teaching and learning. The evidence shows that self directed learning coupled with small group teaching is very efficient (QAA, 2000). The traditional methods which would be recognised by William Harvey, of lectures, notes and set books, still form the backbone of much teaching. The reasons for this are that it is parsimonious in terms of teaching time, and that students and teachers enjoy the ritual. A good lecture is a satisfying Thespian performance and the same notes can last with little modification for years. (Leeder, 2000)

Yet clearly, traditional teaching methods are not, of their own, sufficient to supply the very broad range of skills and competencies a medical student needs to acquire. Interpersonal communications, problem solving skills, teamwork, ethical judgement and sensitivity, to name just a few examples, require very different approaches, arguably the very approaches that have traditionally been used in nursing education. Exponents also emphasize the need for flexible, interdisciplinary education because doctors need to understand how to work effectively in interdisciplinary teams in practice. (Rice, 2000; Leinster, 2002). At the same time, discussions with a number of individuals engaged in teaching statistics and epidemiology (in broadly medical contexts) reveal a real need for a bank of high quality e-learning resources to support and enhance teaching in this traditionally difficult area. Anecdotal evidence also indicates that doctors and health professionals have little formal training in research methods and practice prior to embarking on a research project, and could greatly benefit from flexible learning

[3] MEDLINE, NLM's database of journal citations and abstracts indexes almost 4,500 journals published in the United States and more than 70 other countries.

resources offering support and guidance. It was out of these various, and to some extent competing, needs that the UCEL project was born.

Collaboration, e-laboration

Clearly, e-learning resources are not the single solution to all educational problems. Indeed, Gilbert (2000) asserts that "teaching and learning are not problems that have solutions. They are processes…" in his "Vision Worth Working Toward" where he sets out a model for change at a point in time which he sees as an "exciting discontinuity, the exciting opportunity and threat" he argues for a holistic approach to education. This holistic approach is vital if the aim is to turn out rounded practitioners. Multiprofessional education requires many forms of teaching and learning: e-learning resources can pave some of that road to success by providing high quality, engaging and memorable learning experiences which can liberate teachers from the chore of repetitive explanation of the same concepts, leaving them more quality time to share with their students. Students can benefit from self-directed learning provided they have adequate support and guidance. Lecturers benefit from the creation of these resources; not only do they have a collection at their disposal, but the very processes of creation and sharing engender cultural and political shifts. RLOs can thus be seen as a vanguard for multiprofessional educational change.

The collaborative process itself forces us to think in different ways. It demands that we take the wider view, broaden our horizons. Interdisciplinary collaboration enriches our perspectives, makes us more aware of others; this can only benefit healthcare outcomes in the long term. Lecturers, engaged in the processes of creating RLOs discover the need to reflect on the very processes of teaching and of learning at a fundamental level; this informs their teaching practice in many other situations beyond the world of e-learning.

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