

Universities' Collaboration in eLearning (UCeL): Post-Fordism in action

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Abstract: This paper introduces the UCeL collective (a collaboration between 6 major UK universities) and offers it as a model of a successful community of practice developing, sharing and evaluating high quality interactive eLearning content in the form of reusable learning objects (RLOs). Interactive multimedia is both expensive and labour-intensive to create, so it makes sense to share the burden and the cost. The same topics are being taught across multiple institutions and within many departments which means that duplication of effort is taken place: if generic and reusable resources could be identified and produced, much time and effort could be spared. To achieve this, UCeL has pioneered innovative ways of unlocking content and distributed post-Fordist production processes. This paper explicates the processes with a discussion of the methods, tools and templates that have been developed to enable each stage, with an example from successful practice, and concludes with a “how to” checklist for others wishing to commence a similar initiative.

Introduction: Who We Are

Universities' Collaboration in eLearning (UCeL)¹ is a partnership between a number of UK higher education faculties and is pioneering new methods of collaborative and interactive eLearning content creation. Founded in March 2002 by the Universities of Cambridge, Manchester, Nottingham, East Anglia, Wolverhampton and Peninsula Medical School, UCeL is actively exploring ways in which high quality content can be unlocked and made reusable across the many disciplines comprising the wide field of health professional education. A number of subject areas have been identified as broadly generalisable, and therefore potentially the most promising for generating reusable content across all health professional disciplines. These are: statistics, epidemiology, research methods, anatomy and physiology.

Interactive multimedia is notoriously expensive and time-consuming to produce yet there is evidence that if made and deployed effectively it can enhance the learning experience (e.g. Chalk et al., 2003). Student evaluations show that, provided the materials are high quality, they are well received and valued (Wharrad et al., 2001); consequently if material can be collectively made and shared across courses and institutions then the deliverables will be significantly more cost-effective (Tope, 1996).

The business model for UCeL is not-for-profit and self-funding, with each partner institution contributing an annual membership fee of up to £20,000 depending on the numbers of students. In the interests of sustainability, partners are invited to commit funds for 3 years and according to the amount committed a proportion (~35%) is pre-allocated back to them in commissioned production. The remainder is available for administrative costs (e.g. collaboration web site, methodology development). Outputs are made available to other institutions in the consortium free of charge.

UCeL Production Stages – The Cambridge “Hub”

The eLearning resources are generated in the form of reusable learning objects (RLOs). Derived from the object-oriented programming paradigm (Dahl & Nygaard, 1966), the term RLO was first coined by Wayne Hodgins². RLOs are small, self-contained ‘chunks’ of eLearning each supporting a single learning objective. They

¹ <http://www.uce.ac.uk/>

² <http://www.learnativity.com/waynehodgins.html>

utilise a variety of multimedia components including assessments and activities to maximise learner engagement. Although UCeL is a state-of-the-art eLearning project it is not technology led, focusing on the needs of educators and the demands of their teaching and learning practice. Recognising that (understandably) people dislike having technical solutions imposed upon them, UCeL endeavours to engage educators in the creative processes of content creation in order to harness their invaluable knowledge, skills and ideas and deploy them to effective purpose. By placing people at the centre of eLearning practice, reuse of the resulting resources is further encouraged by the collective sense of ownership that arises from active participation in the project. To achieve this, distributed production processes allow the project to be maintained and serviced by the entire collective. These processes are managed at the UCeL hub.

The UCeL production stages for RLOs are presented in Table 1 and further described in the following subsections. UCeL provides a production pack³, which consists of core documents and is being developed to guide content creators, peer reviewers, developers and evaluators through all stages of the UCeL RLO production.






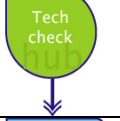
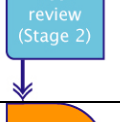
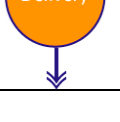
	<p>Content is created by a subject experts using a special template that helps them to organise their materials into a format suitable for RLO development. They can suggest ideas for images and animations. The template contains sections for activities and assessments. Author also create the metadata that indexes the RLO.</p>
	<p>The specification comes to the hub for editing. Written English often requires “chunking” into short, spoken sentences. Unnecessarily long words are replaced with shorter ones for a more informal presentational style.</p>
	<p>The specification is then dispatched for the first stage of peer-review. This consists of a number of formative evaluation questions that aim to improve the RLO. The peer-reviewer, who is the subject expert’s counterpart, in another partner institution, is encouraged to be constructively critical and to offer suggestions for improvement where appropriate. Authors may be required to make some modifications before the RLO moves on to the next stage.</p>
	<p>Once the spec has been approved by the reviewer, it returns to the hub where the media ingredients are assembled. These are the images, video clips, audio files, texts, graphs, spreadsheets etc. - all the components that will be required to make the complete RLO.</p>
	<p>The specification along with the packaged “ingredients” is electronically dispatched to the developer, who is also in a partner institution (usually the same as the author and in close contact with them). The developer, who has received training in UCeL methods, builds the RLO from a “kit of parts” consisting of the ingredients and template.</p>
	<p>The resulting RLO is checked for functionality at the hub to ensure it works correctly and its appearance and behaviours are consistent. The code is checked for efficiency and to see if it is properly commented. Code chunks are also checked for reusability.</p>
	<p>The RLO now goes out for the second phase peer-review, usually back to its first stage reviewer. This ensures that it still meets the learning objective and that nothing has been lost in the development process. If necessary, it may be returned to the hub for further modifications and development.</p>
	<p>The RLO is now indexed and delivered to the web for use and student evaluation.</p>

Table 1. UCeL production stages for RLOs.

³ http://www.ucel.ac.uk/resources/dev_pack.html

Unlocking content

UCeL engages educators; subject experts, typically senior or principal lecturers, in methods of "unlocking content". Templates are provided in the form of Word documents and Powerpoint files that help lecturers organise their material in an appropriate format for multimedia development.

Onsite training takes place in practical, hands-on workshops where lecturers find out at first hand the joys and tribulations of RLO creation. These acclaimed workshops focus closely on teaching and learning issues rather than the technological ones and achieve this by group activities where participants actually create the specifications that are subsequently developed into RLOs.

Distributed development

UCeL is a true national collective and is pioneering methods of distributed development. The content provided by the subject experts at each of the partner institutions is "mediated" at the Cambridge hub.

Here, researchers, illustrators, photographers, sound engineers and technicians turn imagination into reality creating collections of digital images (both stills and video), narrations and texts, using real world data, presented in appropriate format (chart, spreadsheet, simulation), to support the learning objective.

The resulting "ingredients" are then electronically despatched to a selected developer by matching the nature of the content with the specialist skills of each development centre. Distributed production as well as creation engenders a wide sense of ownership that increases uptake, adding further value to these resources. Support and staff development is built-in to the process. The training programme for developers is a one-week workshop to provide an intensive, supportive and creative environment to familiarize partner institutions' developers with UCeL processes, methodologies and software packages to enable them to acquire the necessary skill-set to continue RLO development on their return to their home institutions.

Peer-review

In the first stage of quality assurance, the content specification is peer-reviewed and marked according to a structured scheme by a content expert, who assesses the material for factual accuracy, appropriateness of media choices, effectiveness of assessment, etc. Having passed this stage, the specification is then developed into the online resource. It is then re-assessed by the same reviewer to ensure that it is still "fit for purpose" and now the interactions, animations etc are also evaluated for their level of appropriateness and engagement.

Peer-reviewers are subject experts from UCeL partner institutions, but are not from the institution where the material they are assessing was created or developed.

Evaluation

The components (or media ingredients) that comprise the RLO are evaluated for pedagogical effectiveness and aesthetic quality as part of the creation/discovery process. The individual components build into a comprehensive bank of quality assured resources, which may be downloaded and reused by the entire collective.

RLOs are also evaluated by students across a range of disciplines, courses and institutions. Individual departments and faculty choose how they arrange and make the collection of RLOs available to their students, typically through a VLE/MLE.

Student evaluations feed back into the development and update lifecycle of each RLO.

Example of Successful Practice

What follows is an example of eLearning practice in health professional education in the UK higher education landscape in the form of a short report. UCeL offers a model of how large and diverse organizations can collaborate to assimilate eLearning into their current working practice and shows how eLearning can be deployed in a unifying manner. The individual report flags up a number of possibilities, opportunities and challenges. Further detailed examples have been documented by Leeder et al, (2004), where a collection of stories from each partner institution shows the multi-faceted nature of this pragmatic and innovative project as it attempts to transform promises into practice by empowering and enabling people and focusing on the learning aspect of learning technology.

University of Nottingham – School of Nursing

The School of Nursing at the University of Nottingham is one of the biggest providers of nurse education in the UK with 4000 students, over 200 staff and geographically covering 3000 square miles through five main centres. Development and evaluation of interactive CAL materials with students began in 1995, in the belief that e-delivery of learning, if used appropriately could be used, not to replace nurse educators, but to help them to ‘work smarter’ (Wharrad et al. 2001). This is still the philosophy, as is the desire for students to actively construct knowledge rather than to be instructed (Chapple, Allcock & Wharrad, 1993). Technology can facilitate this process if e-resources are engaging and interactive and by encouraging vicarious learning through on-line communities. UCeL has provided an opportunity to develop and share multimedia resources as part of a multiprofessional collaboration. 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, so it makes a lot of sense for health professional educators to develop sharable materials together. Fostering understanding between lecturers from different professional groups and recognition of what each profession brings to health care is enhanced by collaborations such as UCeL. 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 multiprofessional 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.

A range of subjects has been identified as being suitable for multiprofessional learning including health promotion, communication skills, study skills and research methods and at Nottingham there has been shared learning between medical and nursing students in the biology based subjects in the past. As part of the UCeL collaboration, medicine, nursing and midwifery schools at Nottingham are working together to produce RLOs in a range of subjects including research methods, statistics, pharmacology, pathology and clinical skills. Reaching a decision about what RLOs should be produced to justify the time and costs involved are complex and depend on some or all of the following factors: student demand; the lecturer has to regularly go over the material; scope for reusability in other modules or courses; has not been done (in this way) before; lack of subject specialists; content and materials available in other forms; addresses a single learning objective.

The success and sustainability of the RLO approach depends on producing a critical mass of high quality RLOs before measurable benefits will be gained. This can be tackled in a number of ways:

Firstly, more lecturers need to be engaged in the process of RLO development. Nottingham has run workshops and a one-day conference to introduce the idea of RLOs and to allow staff to gain hands on experience of developing them. The feedback suggests that lecturers who are constantly juggling the competing demands of research, teaching, administration and (in vocational courses) practice supervision, can allocate some of their time to developing small chunks of eLearning. Putting whole modules or courses on-line is a far more daunting consideration.

Secondly, there is also the often misconceived idea that the lecturer has to be able to do all the programming and media development when developing eLearning. Within the Schools of Nursing and Medicine learning technologists support lecturers in planning and producing eLearning materials. The distributed media development approach built into the UCeL framework means that the lecturers (content developers) and learning technologists (media developers) act as a pooled resource for the development of RLOs.

The third point relates to the potential role of the students themselves in producing RLOs. Following a workshop on eLearning attended by a group of health professionals who were studying for a Master’s in Education Studies, one of the students (an A&E nurse) wanted to develop her group’s idea for an RLO as part of her Master’s dissertation. She has produced an RLO on handwashing that will be used for updating and training health professionals in clinical practice. The RLO will be evaluated by expert reviewers for accuracy and relevance, and by nurses and other users in hospitals. Similarly a nursing student is producing and evaluating an RLO on mouthcare for her Master’s dissertation. Along with the theoretical components, interactivity and formative assessment both RLOs contain video clips demonstrating good and bad practice. These are just three of the strategies Nottingham is using to increase the productivity of RLOs.

Conclusions: “HOW TO” Check List

What then, is the most effective approach for those wishing to set up a similar community of practice and to successfully maintain and grow it? The aim here is to provide a set of guidelines based on a combination of the

ethos and guiding principles on which UCeL was originally founded; lessons learned as the project unfolds and strategies as to how to maintain the collaboration and to sustain it into the future.

Above all, UCeL has one central guiding principle and that is that it is people that collaborate and not institutions. With this in mind, it's easy to formulate a list of dos and don'ts to nurture an effective practice:

Do: put people first	Don't: see technology as an end in itself
address areas of real need	be technology driven
ask "should we?"	ask "can we?"
see IT as a medium	see IT as a tool
build bridges between educators & developers	promote an "us and them" culture
be practical, pragmatic, hands on	be theoretical, technical, "nerdy"
understand the political and cultural barriers	focus on the technical constraints
communicate, promote discussion and sharing	keep it secret, guard jealously
be open source, transparent, flexible	be proprietary, opaque, rigid
make it fun, stimulating, engaging	be boring
disseminate widely	keep it to yourself
foster a culture of inclusion	build barriers, cut people out
learn by doing, make mistakes	wait and see – the future never arrives

These are just some examples of how to engage people in effective practice and to foster a collective sense of ownership to promote reuse. Cultural and political barriers often present more constraints than technical ones and it is the former that should be focused on. Inclusion means exactly that; ensure that all the key stakeholders are kept informed and encouraged to contribute their expertise and skills. Top management buy-in (up to Vice-Chancellor level if necessary, but typically Deans and Heads of Departments) is vital to ensure institutional commitment (and it is these people who will be signing the cheques) but equally important is the need to engage staff at the chalk-face and computer screens, for it is their expertise that must be nurtured and harnessed to obtain excellence in eLearning resources, and they are the people who will encourage their students to use and evaluate the resources.

Wide dissemination is also vital to spread the word (and good news travels fast). Hands-on, engaging workshops allow prospective partners to find out for themselves the joys and pitfalls of RLO creation. Developer training programmes, such as the occasional residential courses run by UCeL, can promote a community of shared best-practice in a supportive and social atmosphere. The bonds forged in these interactions are the glue that holds the community together. Knowledge shared is knowledge gained. Every chance to disseminate (such as this one) in the form of presentations, papers, conferences, seminars, press releases and newsletters should be taken, providing it doesn't detract from the main goal of enabling the community.

All of these activities take a great deal of time and energy to effectively implement and maintain and this expenditure should not be underestimated. Regular review and reports are helpful to reflect critically on progress achieved and to plan what further actions are needed to strengthen and deepen the collaboration. Strategic alliances with other organisations and those engaged in similar activities should be sought and the many additional funding opportunities should be carefully monitored and applications made where appropriate.

With a variety of faculties contributing to the UCeL collaboration, it seems that the model can readily be generalised to support a wide range of educational needs. 100 students taking the online masters at Manchester and 4000 student nurses at Nottingham have found the same two RLOs an effective aid to study despite their different backgrounds. By focusing on "difficult" topics, reusability can be further encouraged, and by applying high production values an engaging educational experience can be created. There is undoubtedly a real need for these resources and preliminary evaluations have found that students find them useful and valuable. The next task will be to provide a detailed table of topics in statistics for each of UCeL's many health professional disciplines to discover which can be identified as most reusable. The School of Nursing at Nottingham has already begun this process and the expertise they amass in so-doing will benefit the entire collaboration as their results feed back into the wider community. It is a true "propitious" circle.

From enthusiastic participation in the workshops; 'spin-off' funding attracted to provide teaching fellowships and parallel RLO collections; eLearning seen not as a replacement but more as a powerful ally; a wide range of subjects targeted at potentially difficult areas of teaching at the chalk-face; supporting diversity within areas of broad commonality; enhancing staff and students' IT skills; a robust peer-review process to ensure quality; providing practical support with the tools and templates required to produce the RLOs and evaluate them effectively; here is ample evidence for the real needs this collective addresses as a growing community gathers strength and takes shape.

The debate over whether RLOs will benefit the education community is currently hindered by the lack of research on RLO use in practice. The learning economy using RLOs will only be achieved if it is embraced not only by the enthusiasts but also by the wider learning community. Published work in this field is not generally based on empirical research so it is difficult for lecturers to make informed decisions about any benefits, for them, of embracing the opportunities offered by RLOs. The UCeL collaboration has the infrastructure to be able to strengthen the evidence base for eLearning by carrying out research projects alongside RLO production. Some of the research questions relating to sharing and reusability of RLOs within and between professional groups and institutions might be answered.

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