

UNIVERSITIES' COLLABORATION IN ELEARNING (UCeL): A VIRTUAL COMMUNITY OF PRACTICE IN HEALTH PROFESSIONAL EDUCATION

Dawn Leeder

*University of Cambridge, UCeL
CARET, 16, Mill Lane, Cambridge CB1 2SB UK
dawn@ucel.ac.uk*

John C McLachlan

*Peninsula Medical School
john.mclachlan@pms.ac.uk*

Veena Rodrigues

*University of East Anglia, Medical School
v.rodrigues@uea.ac.uk*

Nicki Stephens

*University of Wolverhampton, School of Health
N.J.Stephens@wlv.ac.uk*

Heather Wharrad

*University of Nottingham, School of Nursing
Heather.Wharrad@nottingham.ac.uk*

Patrick McElduff

*University of Manchester, Department of Public Health
Patrick.Mcelduff@man.ac.uk*

ABSTRACT

Universities' Collaboration in eLearning (UCeL) is a partnership between a number of UK schools of nursing, medicine and health studies and is pioneering new methods of 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. 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 and student evaluations show that, provided the materials are high quality, they are well received and valued; consequently if material can be collectively made and shared across courses and institutions then the deliverables will be significantly more cost-effective. 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. 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 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. Because UCeL is a national collaboration spanning a number of faculties, each partner has its own view of how the collective functions and how it impacts on their teaching and learning practice. The aim is to draw together these diverse views to offer a snap-shot of an effective community of eLearning practice during a period of rapid evolution. This paper presents an overview of eLearning practice in health professional education across the UK higher education landscape in the form of a series of short reports presented by either an educator or a developer from each partner institution. It offers a model of how large and diverse organisations can collaborate to assimilate eLearning into their current working practice and offers

recommendations and suggestions for others to set up a similar collaboration. The individual reports flag up a number of possibilities, opportunities and challenges. Taken as a whole, the collection of six stories 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.

KEYWORDS

eLearning, collaboration, community of practice, web-based, interactive, multimedia

1. BACKGROUND

Universities' Collaboration in eLearning (UCeL) 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.

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 and student evaluations show that, provided the materials are high quality, they are well received and valued; consequently if material can be collectively made and shared across courses and institutions then the deliverables will be significantly more cost-effective. The business model 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.

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. The eLearning resources are generated in the form of reusable learning objects (RLOs). RLOs are small, self-contained 'chunks' of eLearning each supporting a single learning objective. They 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.

What follows is an overview of eLearning practice in health professional education across the UK higher education landscape in the form of a series of short reports presented by either an educator or a developer from each partner institution. It offers a model of how large and diverse organisations can collaborate to assimilate eLearning into their current working practice and shows how eLearning can be deployed in a unifying manner. The individual reports flag up a number of possibilities, opportunities and challenges. Taken as a whole, the collection of six stories 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.

2. PENINSULA MEDICAL SCHOOL

Peninsula Medical School is a new organization, managed by the Universities of Exeter and Plymouth in association with NHS Partners, which accepted its first intake of 130 students in September 2002 and its second steady state intake of 176 students in September 2003. It is a full five-year undergraduate

programme, with problem based learning as its key method of delivery. The Peninsula Medical School, as its name indicates, is intended to operate throughout the south-west of England, where facilities are variable in nature, and transport infrastructure is poorly developed. Electronic communication is therefore more important than in many institutions. As a consequence, a virtual learning environment (VLE) was placed at the heart of the learning landscape from the beginning of the project. All staff must use it for all parts of the course, and students must access it for all teaching materials and course information.

However, this requires that high quality materials be provided to populate the VLE. The medical course is designed around the principle of self-directed learning, requiring materials well adapted for this purpose. For instance, it is essential that they be consistent in presentation style and include self-assessment materials. This means that if the concept of RLOs did not exist, we would have had to invent it, and since we cannot produce all the necessary RLOs, joining a consortium is essential.

However, UCeL provides more than just the possibility of shared RLOs. It provides a forum in which to circulate ideas, and resolve both technical and pedagogic problems. While the former tend to engross IT staff working in this area, the latter are more significant, and there are relatively few opportunities to discuss these across disciplines. The collaboration also provides the 'activation energy' needed to start a project. Often, day-to-day operational issues mean that it is tempting to delay the commencement of a particular RLO. Participating in a collaborative project, where a moral commitment has been given to a particular set of activities, gives the RLO an appropriate place in the timetable. Once an RLO has been commenced, then the nature of the team work process at Peninsula ensures that it continues and is completed against a realistic time table.

To the collaboration we bring a dedicated IT staff working within a large well-equipped multimedia space, designed specifically to undertake such activities. Staffing levels have responded largely to the developing needs of the course as a whole, and provide an interesting insight into the number of personnel required. Currently, these include an IT manager, a multimedia developer, a database developer, and a VLE developer with a full time assistant. Valuable use has been made of IT students on one-year placements. These individuals (normally three at any one time, but with an overlap so that the outgoing students can induct the new ones) have proved adept at solving technical problems under the close supervision of the lead multimedia developer. Close co-operation between the lead academic staff member and the project developer is essential, but pressures on academic staff time are even greater than those on IT staff, and the principle is that the academic staff member will not do anything that can be done by the IT partner.

The use of the VLE within a problem based learning curriculum provides a natural way for RLOs to be presented to the students. Evaluation of the use and effectiveness of the RLOs will take time and effort, but initial student and staff feedback is very positive. The peer review process means that the RLOs have face validity, and the design structure promoted by UCeL means that the RLOs are of appropriate size and are truly 'reusable'.

Of course, challenges also arise. These have included interoperability issues between operating systems, and the problem of devising an internal strategy for RLO project selection. Since we are developing RLOs for the first time (inevitable in a new organisation!) we are currently taking a rather experimental approach to their selection. Currently, this is essentially 'interest led' by individual academic staff members, who propose topics which they feel are suitable for RLOs, generally where they already have materials capable of being adapted for this purpose. These tend to focus on single topics suitable for isolated treatment, and the field is so vast that this approach is adequate for the foreseeable future. However, in time the more difficult problems of subject integration will have to be encountered.

The potential scale of the task is considerable. EU rules suggest that a medical undergraduate course should represent some 6000 hours of actual study, and all of this could be supported by RLOs (since different institutions will deliver variable parts of the course by other means). However, at the moment it is impossible to understate the value of developing an extending cadre of technical and academic staff familiar with the problems of developing RLOs, in addition to the production of RLOs themselves.

3. UNIVERSITY OF EAST ANGLIA – SCHOOL OF MEDICINE, HEALTH POLICY AND PRACTICE

The University of East Anglia, Norwich has been a member of the UCeL project from the outset. Originally subscribed to by the School of Medicine, Health Policy and Practice, UCeL is now gaining more widespread recognition and participation across the University.

RLOs offer a potentially valuable learning resource; however, expertise in their development needs to be created. An inter-disciplinary teaching fellowship (2002-2003) awarded to two principal lecturers in the School of Nursing and Midwifery and the School of Medicine, Health Policy and Practice enabled the start up of such expertise within the UEA and indicated the level of institutional support for the collaboration above and beyond the original funding commitment. The fellowship enhances the ability of the applicants to design and implement RLOs in the provision of teaching and learning for health care students at under- and post-graduate levels and also enables the 'roll-out' of this expertise to other academic staff in the Health Schools.

The project is directly relevant to UEA's three key learning and teaching strategies, which are: to develop research-led teaching and learning as one of the hallmarks of education at UEA; to enhance the quality of the learning and teaching environment and experience; and to enhance access, participation and progression by a diverse range of students who are able to benefit from higher education and continue to develop learning support appropriate to the needs of a diverse student population.

Two workshops held at the UEA drew a response from a multidisciplinary group of very interested and enthusiastic staff members, each bringing with them a different skill-set and subject expertise, leading to the creation of the specifications for eight RLOs. Of these, it was felt that no less than five themes could be developed further and would be of potential interest and use to more than one UEA health school. The added value of the workshops was the involvement not only of content experts but also potential developers from the UEA Learning Technology Group, which offers advice and support on the effective use of technology in learning and teaching. This group runs and supports Blackboard, UEA's chosen virtual learning environment. This new development offers the potential for creating and developing RLOs in-house at the UEA, after suitable training.

In the short-term, it is planned that RLOs which are relevant to more than one health school and therefore potentially the most generalisable, will be priorities for development. The simplest method of topic selection for an RLO is for a content expert to identify a common problem areas for students. This method ensures that teachers have materials to support the teaching process in these areas, and students have access to an extra resource for a potential area of difficulty.

4. 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'. This is still the philosophy as is the desire for students to actively construct knowledge rather than to be instructed. 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 we have appointed learning technologists to 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.

5. UNIVERSITY OF WOLVERHAMPTON – SCHOOL OF HEALTH

When RLOs were first explored with staff from the School of Health at the University of Wolverhampton, their potential value was immediately apparent from a number of perspectives. The University of Wolverhampton's Strategy for Learning and Teaching (2002-2005) has threefold priorities: for staff to develop an intellectually responsive learning community; for students: to develop as independent learners; and for technology supported learning to develop the interactive learning environment.

The notion of RLOs fits comfortably with these priorities. The Learning and Teaching Strategy for the School of Health, reflects the annual targets of the University strategy and the development of RLOs has become one of the key targets.

The School is commissioned to recruit and educate pre-registration students to meet staffing requirements of local health care providers. There are currently 1762 students undertaking a 3 year programme of study culminating in Registered Nurse status, with a Diploma of Higher Education (RNDipHE). There are also approaching 100 students studying for RNBSc and 100 for RMBSc – Registered Nurse and Registered Midwife linked to an undergraduate award. Whilst this pre-registration study accounts for the majority of the student numbers there are also undergraduate students undertaking a range of pathways, such as a Foundation Degree in Community Health and Social Care and BSc(Hons) Complementary Therapies.

Although there is great diversity in the subject areas addressed within the School, there is equally commonality. All clinical practice needs to be based on best available evidence. To do this, practitioners need to understand the nature of evidence. Again, as practitioners, they work within social and political frameworks. Whatever their area of practice, politics will have an impact on how care is to be provided. These are but a couple examples of areas of commonality that would benefit from the development of RLOs.

Availability of study materials in a range of formats is also becoming an increasingly important issue. Whilst the taught mode is still utilised for many pathways, some students find it difficult to access taught

modules on a regular basis. Flexible approaches to learning are seen to be increasingly valuable, to afford students opportunity of access to study and professional development. This is particularly the case with qualified health care professionals.

Students studying at the University of Wolverhampton have access to WOLF (Wolverhampton Online Learning Framework), a purpose built, computer-based learning environment developed by the University. Its aim is to enable students to access materials and activities associated with topic areas quickly and easily. As the staff within the School of Health have engaged increasingly with WOLF, developing topics based on the modules that they are delivering, the materials being put into the WOLF topics has become increasingly interactive. This, coupled with recognition by the staff involved that there are areas of commonality across pathways, has led to acknowledgment of the value of the development of objects that are both interactive and reusable. It is believed that reusable learning objects will enhance both learning and teaching activities.

These are but a few of the reasons why the opportunity to develop RLOs has been welcomed by the School of Health. It is an opportunity to maximise on areas of learning and teaching; to encourage interactivity and to contribute positively to the learning and teaching targets of both the School and the University. It is also too good an opportunity to miss, to share good practices within a School, but also across a number of institutions.

6. UNIVERSITY OF MANCHESTER – EVIDENCE FOR POPULATION HEALTH UNIT

The Evidence for Population Health Unit (EPHU) at the University of Manchester is currently delivering a web-based masters programme entitled Masters of Population Health Evidence (MPHe) to around 100 students. This contains an Introduction to Biostatistics and Epidemiology module with web-based content comprising textual materials and graphs, some required reading from a specified text book, some additional reading from on-line text books, plus a few links to interactive Java applets, which are used to demonstrate simple statistical principles.

Whilst these types of material are of sufficient quality and variety to be appropriate for teaching purposes, they fail to take full advantage of the electronic medium through which they are being delivered. The UCeL approach has the ability to bring this material to life through the use of colour, movement and sound, and in time it will be possible to combine materials from different levels and contexts to suit individual learner need.

The majority of students at Manchester report that they find it difficult to read large amounts of text from the computer screen so they usually choose to print out all reading material. The RLOs being developed as part of the UCeL collective are far easier to view directly from the computer screen. The inclusion of movement in the RLOs brings the pages to life and animations are usually designed to highlight some of the points being made in the text that makes the text easier to follow and increases its comprehensibility.

The University of Manchester has recognised that web-based teaching is an important part of the learning mix and a growing number of departments are delivering on-line materials. Within the university a special project has been established to develop interactive web-based material for basic quantitative methods. There are regular meetings of the various groups who develop and teach using web-based material and it is the experience of these groups Manchester offers the UCeL project. In addition, because staff have many years experience of delivering teaching material via distance learning they have an in-depth understanding of the problems faced by remote and isolated learners.

Despite the University's positive attitude to web-based teaching and distance learning there are still some political and cultural barriers to overcome. The administration system is designed for full-time undergraduate students and it is not appropriate for students who enrol on a web-based masters. Furthermore there is a reluctance to embrace the electronic delivery of teaching material and the danger that RLOs may be seen as a gimmick. Some of the reluctance comes from the view that the electronic delivery of material is an impersonal teaching medium and that the personal satisfaction of the teacher is lost. UCeL goes some way to overcoming this potential problem with its focus on the educational aspects (rather than the technology) and its ethos of "you can't replace face-to-face" with a mission to integrate eLearning alongside with all other teaching and learning activities.

This semester, two RLOs have been presented as part of the Introduction to Biostatistics and Epidemiology Module; these are "Levels of Measurement", a gentle introduction to the four levels of

measurement (nominal, ordinal, interval and ratio) and “Power and Sample Size” which explains about Type I and II errors and shows how variables affect the power of a test. In both topics the learner is presented with some introductory material and some required reading and the RLO is included to bring a new interactive dimension to the learning experience and to aid greater understanding.

Informal evaluations and anecdotal evidence indicates that students are responding very positively to the RLOs and see them as a valued component of the course. Frequent comments were that they found them much easier to understand than the static material, very easy to use, and they also aided retention of the learned material. Next year, the RLOs will be even more closely integrated into the online course and will replace some of the existing textual material.

7. HOW TO SET UP A SUCCESSFUL COMMUNITY OF PRACTICE

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; the various “takes” on the UCeL collaboration as reported in the snapshots above; 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, 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.

8. CONCLUSION

With such a great variety of institutional “takes” on 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.

REFERENCES

- Casey, J and McAlpine, M Viewed 4 September 2003 *Writing and Using Reusable Educational Materials* <http://www.gla.ac.uk/rcc/staff/mhairi/index.html>
- Chapple M, Allcock N & Wharrad HJ, 1993 Bachelor of nursing students' experiences of learning biological sciences alongside medical students. *In Nurse Education Today* Vol 13, pp 426-434
- Leeder, D. Wharrad, H and Davies, T. 2002 *Beyond Institutional Boundaries: reusable learning objects for multi-professional education* http://www.ucel.ac.uk/documents/docs/dublin_paper.doc Viewed 9 September 2003
- Leeder, D. Davies, T and Hall, A. 2002 *Reusable learning objects for medical education: evolving a multi-institutional collaboration* <http://www.ucel.ac.uk/documents/docs/068.doc> Viewed 9 September 2003
- Littlejohn, A Chapter 1: Issues in Reusing Online Resources. *In: JIME Special Issue: Reusing Online Resources.* (Eds.) Allison Littlejohn & Simon Buckingham Shum
- Tope, R 1996 *Integrated interdisciplinary learning between health and social care professions: A feasibility study.* Aldershot: Avebury.
- Wharrad, H.J., Kent, C., Allcock, N, & Wood, B, 2001 A comparison of CAL with a conventional method of delivery of cell biology to undergraduate nursing students using an experimental design *In Nurse Education Today*, Vol 21, 579-588
- Universities’ Collaboration in eLearning <http://www.ucel.ac.uk/> Viewed 10 September 2003
- University of East Anglia, Norwich, Norfolk: *Learning and teaching strategies for 2002-03 to 2004-05* <http://www.uea.ac.uk/lta/teachstrats.htm> Viewed 13 November 2003