

<b>Cover Sheet for Proposals</b> (All sections must be completed)	<b>JISC Capital Programme</b>	
<b>Name of Capital Programme:</b> e-Learning		
<b>Name of Lead Institution:</b> Lancaster University		
<b>Name of Proposed Project:</b> ENGAGE: Enabling Personalised Learning across VLE Platforms using Mobile Devices		
<b>Name of Project Partners:</b> Liverpool University, CLEO, BBC		
<b>Full Contact Details for Primary Contact:</b> <b>Dr Nicholas J. P. Race</b> Research Lecturer Network Research and Special Projects Unit, Information Systems Services (ISS), Lancaster University, Bailrigg Lancaster, LA1 4YW Tel: 01524 510123 Fax: 01524 53608 n.race@lancaster.ac.uk		
<b>Length of Project:</b> 24 months		
<b>Project Start and End Dates:</b> September 2006 – August 2008		
<b>Total Funding Requested from JISC:</b> £193,145		
<b>Funding Broken Down over Project Years:</b> Year One: £80,477      Year Two: £112,668		
<b>Total Institutional Contributions:</b> £78,052		
<b>Outline Project Description</b>  The Engage proposal is designed to build on existing partnerships in order to evaluate and extend the use of mobile technologies to make information accessible to both teachers and learners at the right time, at the right place, and in the right form. This cross regional proposal will involve a number of commonly used learning environments including Domino, Moodle and uPortal and take a standards based approach in providing a new open, flexible, and personalised learning experience delivered through mobile and wireless technology.  This proposal is based around the <i>real</i> need for <i>improved communication</i> with learners, more <i>open access</i> to teaching resources when mobile, <i>support</i> for learners in work-based environments and <i>personalised</i> learning experiences through mobile devices.  The project is strengthened through its close collaboration with CLEO (Cumbria and Lancashire Education Online), allowing additional evaluation of the work to be carried out within the context of school-based learning environments. This will provide a useful insight into a number of different issues such as <i>progression</i> , namely the progression of content and information between learning systems and environments; <i>accessibility</i> , issues relating to learners with different abilities including those with special needs; and <i>flexibility</i> , with respect to the delivery of learning materials outside of the HE/FE communities. The relationship with CLEO adds significant value to the project without additional cost, offering a large scale pilot study with the potential for much wider dissemination and impact within the educational sector.		
<b>I have read the Circular and associated Terms and Conditions of Grant at Appendix B (Tick Box)</b>	<b>YES</b> ✓	<b>NO</b>

# ENGAGE: Enabling Personalised Learning across VLE Platforms using Mobile Devices

## 1 Introduction

*A brief outline of the rationale for and nature of the work to be undertaken, the length of the project, start and end dates, and a summary of how the project will contribute to the programme..*

### 1.1 Overview

The Engage proposal is designed to build on existing partnerships in order to evaluate and extend the use of mobile technologies to make information accessible to both teachers and learners at the right time, at the right place, and in the right form. This cross regional proposal will involve a number of commonly used learning environments including Domino, Moodle and uPortal and take a standards based approach in providing a new open, flexible, and personalised learning experience delivered through mobile and wireless technology.

Lancaster University has several well established partnerships that together form the consortium for the Engage project:

- Cumbria and Lancashire Medical and Dental Consortium is a regional partnership<sup>1</sup> with three other universities working to expand undergraduate medical education across the region (see Appendix B for further details);
- Cumbria and Lancashire Education Online (CLEO)<sup>2</sup>, a consortium providing broadband, content and VLE services to schools throughout the region;
- British Broadcasting Corporation (BBC), New Media and Technology are investigating the use of new and accessible technological developments which can actively engage learners.

### 1.2 Rationale

From 2006-07, fifty medical students will undertake the University of Liverpool's five-year Medicine and Surgery MBChB degree based entirely at Lancaster University and in hospitals in the Morecambe Bay area (see appendix B for more details). These students count in Liverpool's HESA numbers and will be formally registered as Liverpool students; they will have access to the electronic resources of both universities. They will be using the Liverpool University VLE (VITAL) as their main source of course information, but lecturers and other staff from Lancaster University and from the hospitals will need to be able to communicate with them easily. This proposal is therefore based around the *real* need for *improved communication* with learners, more *open access* to teaching resources when mobile, *support* for learners in work-based environments and *personalised* learning experiences through mobile devices. Scenarios which illustrate the aforementioned themes more clearly are described in section 1.4.

The project is strengthened through its close collaboration with CLEO, allowing additional evaluation of the work to be carried out within the context of school-based learning environments. This will provide a useful insight into a number of different issues such as *progression*, namely the progression of content and information between learning systems and environments; *accessibility*, issues relating to learners with different abilities including those with special needs; and *flexibility*, with respect to the delivery of learning materials outside of the HE/FE communities. The relationship with CLEO adds significant value to the project without additional cost, offering a large scale pilot study with the potential for much wider dissemination and impact within the educational sector.

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<sup>1</sup> The Cumbria and Lancashire Medical and Dental Consortium consists of the University of Liverpool, Lancaster University, St Martin's College and the University of Central Lancashire.

<sup>2</sup> A consortium between Lancashire and Cumbria Local Education Authorities - <http://www.cleo.net.uk>

## 1.3 Aims and Objectives

The Engage project will enable Lancaster University, its partners and the wider community to accelerate existing developments in support for e-learning and e-administration of learners.

Specifically, the project will:

- a) Extend SMS text messaging facilities to students not formally enrolled on Lancaster University HESA courses.
- b) Extend the accessibility of VLE's to mobile devices such as mobile/smart phones.
- c) Text removed – Section 43 (Commercial Interests)
- d) Provide personalised feeds (e.g. RSS) for use in the Liverpool University portal (or any other collaborating institutions student information service);
- e) Evaluate the provision of service oriented connection with partner organisations.
- f) Provide timely news services (e.g. RSS and Atom feeds) to designated public display screens (e.g. across Lancaster's campus and regional Hospitals) and both public and personalised feeds to associated institutions' student information systems (e.g. Portals);

## 1.4 Scenarios

The following scenarios illustrate the primary goals of the work using examples from within the HE sector although the scenarios themselves may reflect more general requirements:

### 1.4.1 Scenario One: VLE Integration

Gerry Marsden, a student on the Lancaster MBChB course, logs into his uPortal page (hosted by the University of Liverpool) to check for new material on the course web space. He reads a recently posted news item (written by a course administrator at Lancaster) alerting Gerry to a public lecture by a visiting academic the following evening.

*Key technical challenge: Integration between multiple institutional VLEs.*

### 1.4.2 Scenario Two: Mobile Access to VLEs

The next afternoon Gerry is about to make his way to the Lancaster University campus by public transport for the lecture when he receives a text message to say that the lecture has had to be re-scheduled for later in the week. Gerry is glad he didn't waste time travelling to a postponed lecture. However, since Gerry had already decided to go to Lancaster that evening he decides to go anyway. On the way, he uses his mobile phone to browse VLE content while on the train. He notices that a new interactive text message service has been announced and he decides to sign up. The service will send personalised revision material on a daily basis as the lead up to the final exams begin.

*Key technical challenge: Supporting VLE content to be rendered on mobile devices and the development of a text messaging service and VLE communications API/Web service.*

## 2 Scenario Three:

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### 2.1.1 Scenario Four: RSS based Information

As Gerry leaves the library, he again passes the public display information screen which is displaying news articles news articles retrieved from Liverpool's existing announcement system via RSS.

*Key technical challenge: Supporting the creation and integration of personalised news feeds (such as Atom and RSS) between multiple VLEs and portals.*

## Scenario Five

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### 2.2 Project Duration

The proposed Engage project length is 24 calendar months (September 2006 – August 2008). A detailed breakdown of the project time plan is included in section 2.1.

### 2.3 Contribution to the Programme and Impact

The work proposed is part of the core e-learning strategy at Lancaster University (see appendix C), Liverpool University and within CLEO and therefore carries **significant contributed effort** by the partners. The proposed work takes advantage of the *significant investment and strength of the existing infrastructure* already in place and supported at **Lancaster University**. This includes considerable experience of implementing course materials using VLEs, working with interoperability and open standards, in house VLE development experience and mobile computing research expertise all provide the project with a concrete foundation on which to build.

The proposal includes the following activities in support of the strategic aims articulated in the DfES e-Strategy and the HEFCE e-Learning Strategy:

- *The use of new technology and innovation to support flexible delivery and personalised learning experiences.*
- *Engagement with students to ensure that provision meets their needs.*
- *The support of learners with special needs.*
- *The support of more learner-centred provision.*
- *The facilitation of access to HE throughout life, including through the provision of local opportunities, and through part-time and distance learning.*
- *The provision of HE in the work place and in other places outside HEIs.*

In addition, some of the areas outlined above are highlighted by the DfES strategy 'Harnessing Technology: Transforming learning and children's services' as being key areas for development over the next five years and beyond. Within the DfES strategy 2005 which identifies six priority areas for personal learning, the following two areas will be directly addressed by this project:

- *Integrated online personal support for learners*
- *A collaborative approach to personalised learning activities*

Since a large part of the educational process is that of reflection and internal distillation we will focus efforts on this particular phase since this needs to take place independently of the physical learning environment (in what may be termed the *Personal Learning Environment* or PLE) and therefore lends itself well to the introduction of mobile technology. In order to facilitate continuity in the learning process, the Engage project will focus on support for so called *offline* learning. Specifically, we intend to use the existing patterns of social activity and communications such as SMS text messaging as a mechanism for supporting remote collaboration and communication since this can easily be exploited any place, any time. We believe these technologies are presently heavily underused but are highly likely to be very amenable and offer valuable learner benefits.

## **3 Project Description**

*A description of the intended project plan, timetable and deliverables, risks, and an explanation of how the detailed project outcomes will be of value to the JISC community.*

### **3.1 Project Plan and Timetable**

An initial three month period is devoted to planning and specification (with respect to understanding the information and workflow both internally and externally within the partner Institutions). As there will be no requirement to recruit staff for this project, this activity can leverage existing personnel and can be considered low risk. All partners have long standing and stable teams and where there may be a possibility of staff turn-over, this is not considered to be a significant concern.

The primary programme will commence in November 2006 and is divided into three inter-related streams of activity:

#### **3.1.1 Interoperability**

The main funded work on development and implementation will begin in November 2006 and will initially focus on integration between the various VLE platforms used across the institutions. We anticipate some requirements of Personal Learning Environments and will work towards making the Lancaster VLE compatible with developments in this area, such as the PLEX reference model by CETIS. The project aims to resolve particular interoperability challenges as well as scope for future e-learning trends. Interoperability will be tackled in several ways throughout the lifetime of the project. The first phase of pilot studies will focus primarily upon VLE interoperability and exploit web service interfaces to provide a seamless interface between systems. Following this the focus will move towards supporting interoperability between VLE services and mobile devices such as phones.

The pilot studies will be used as the mechanism for highlighting and tackling the various interoperability challenges and we anticipate solving the main technical challenges during these phases of use.

#### **3.1.2 Communication and Access**

Initial work on interoperability will be followed by development which targets mobile access to VLE platforms and subsequently communication between VLEs and mobile devices. This will require development work on the back-end systems and open interfaces to support mobile phones and technologies such as RSS.

Adherence to standards is vital and the project systems will ensure conformance with the latest versions of appropriate protocols, particularly where these might support future implementations of Personal Learning Environments, for example Atom, FOAF, OPML and Web Services (SOAP). Most of the development work will be carried out in Java and the full system will be made available as open source.

### 3.1.3 Evaluation:

The Project will seek to use dissemination activities to inform evaluation so that we can build on previous or parallel activity and highlight those parts of our work that are not replicated elsewhere. We will look to ongoing work such as that being undertaken by the longer-term and in-depth European Leonardo projects, for example work by Rekkedal, as a basis for comparison with this project.

The evaluation priorities are:

1. User feedback
2. Take-up of the new communication opportunities by students and lecturers
3. Investigation of cultural change within the partner institutions
4. Monitoring and reporting the progress of the Project

Evaluation will be Formative by:

1. Interview of selected students and lecturers (with baseline information)
2. Testing of new interfaces and systems with small groups of students
3. Interview of selected staff partner institutions regarding ease of implementation and use

The second year of the Engage project will focus primarily on both local and regional level user trials initially between Lancaster University staff and the Liverpool University students studying in the Lancaster district. Later in the project, the facilities will also be available to a much larger number of students studying with Lancaster's School of Lifelong Learning and affiliated institutions yielding more significant quantitative and qualitative results.

There will be learning and evaluation results for the wider sector throughout all three streams of the project; Ongoing analysis of the project operation and its refinement will be carried out in addition to the technical applications developments and analysis evaluated as part of the pilot studies.

A detailed breakdown of the project activities is presented in figure 1 below.

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## 3.2 *Project Partners and Details*

This project will enable the technical expertise and research expertise to be brought together in order to accelerate existing VLE development work both within the institution and across the North West region. The project will involve close collaboration with the following collaborators:

- **The University of Lancaster:** Lancaster University who have significant track record in building, deploying and evaluating large scale systems both within a research context <sup>3</sup> and on a production level <sup>5</sup>.
- **The University of Liverpool:** The Cumbria and Lancashire Medical and Dental Consortium (consisting of the University of Liverpool, Lancaster University, St Martin's College and the University of Central Lancashire) was recently successful in its bid to HEFCE and the Department of Health to expand undergraduate medical education in Cumbria and North Lancashire. The University of Liverpool has been awarded additional places from September 2006 for students to study the full five years in the region, with Lancaster University as their academic base. These students will be admitted to a discrete route following the internationally acclaimed Liverpool MBChB programme, with their clinical experience based in the University Hospitals of Morecambe Bay NHS Trust and in Morecambe Bay Primary Care Trust. The students will be based on the University campus, where facilities will include a Clinical Anatomy Learning Centre. A Clinical Skills Centre will be provided at the Royal Lancaster

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<sup>3</sup> <http://www.mobileipv6.net/>

<sup>4</sup> <http://www.guide.lancs.ac.uk/>

<sup>5</sup> <http://domino.lancs.ac.uk/>

Infirmary. The University of Central Lancashire and St Martin's College will deliver Special Study Modules (SSMs) in their specialist areas, and will contribute to areas of inter-professional education.

- **Cumbria and Lancashire County Councils** have partnered to form *CLEO* (Cumbria and Lancashire Education Online) which is working towards broadband provision for all schools across Cumbria & Lancashire.
- **BBC New Media, Creative Research & Development** are presently working with the BBC Learning division to develop new educational services such as the recently launched BBC jam<sup>6</sup> with a focus on accessibility and personalisation. The BBC's role would be as an active reference group and they would be vital in helping the project to share knowledge, comment and analyse results as well as provide active participation in concept generation for the appropriation of new technologies.

The proposed project is designed to build on the well established learning environments at each partner Institution. The proposed work forms *part* of the strategic plans of all partners and as such must be viewed in that context rather than in isolation (see appendix). Funding is sought to allow overall acceleration of progress in this area and to enable the work to reach the widest possible audience.

### ***3.3 Implementation and Conduct of Project***

Dr Nicholas Race at Lancaster University will direct the project, and overall project management will be carried out in conjunction with Dr Paul Rodaway (Director of the Learning Technology Group), John Smith (Director of Medical Studies, University of Liverpool) and Prof. Barry Forde (CLEO Executive). Overall the project will report to Lancaster's Information Services' Senior Management team and Liverpool's Medical School Management Board.

Project management will be based on a clearly defined set of work packages, with a general management approach which encourages lively styles of collaborative development. A particular emphasis will be given on managing risk by critically reviewing project progress at executive board meetings and the auditing of external developments in regular project review phases. A steering committee will be established as part of the initial planning phase and this will include members from each participant University department and project collaborator. Quarterly steering committee meetings will be used to review project progress and maintain direction and maximise impact

#### **3.3.1 University of Lancaster**

At Lancaster, work will be carried out largely by experienced technical developers in both the Learning Technology Group (LTG) and Network Research and Special Projects unit (NRSP). A technical developer (Zhen Cai) within the LTG (led by Mark Bryson) will be used to carry out the VLE API and integration and funding will be used to buy out their developer effort. A technical developer (Duncan McCaffery) within NRSP (led by Dr Keith Mitchell) will provide expertise within the area of mobile communications which focus highly in their current research activities. Information Systems Services (ISS) will provide (contributed) IT support and maintenance for the overall project. Hennie Yip's time will be contributed to the project and as an LTG e-learning advisor will work on primarily on the evaluation stream as well as liaising with teaching staff.

#### **3.3.2 University of Liverpool**

Liverpool University's institutional student portal will use generic and personal RSS or Atom feeds from the Lancaster VLE to provide personalised information to students. Text removed – Section 43 (Commercial Interests)

Liverpool will make use of JSR168 portlets to consume Lancaster's RSS feeds and will modify their existing announcement system to provide an RSS feeds for Lancaster's consumption.

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<sup>6</sup> <http://jam.bbc.co.uk/>

### **3.3.3 Cumbria and Lancashire Education Online (CLEO)**

The CLEO consortium have recently committed over £500,000 and three full time technical members of staff to support the hosting and maintenance of VLE services across the regions of Cumbria and Lancashire. Close collaboration with this group will be maintained throughout the lifetime of the project in order to maximise impact and ensure regional interoperability with other external VLEs.

### **3.3.4 British Broadcasting Corporation (BBC)**

The BBC New Media and Technology department (led by Dr Adrian Woolard) are working with the BBC Learning division to develop new educational services and digital content, such as BBC jam <sup>7</sup>. The BBC's role would be to act as an active reference group and would play a vital role during both the evaluation and dissemination phases of the project. More specifically, they would help share knowledge and comment and analyse user trial results as well as provide active participation during the concept generation for the appropriation of new mobile technologies.

## ***3.4 Deliverables***

The specific deliverables for this project will be:

- Text removed – Section 43 (Commercial Interests)
- Qualitative and quantitative results from pilot studies which demonstrate the use of cross-institutional mobile e-learning and subject delivery.
- An evaluation report which present best practise
- An evaluation of learners' experiences of using the technology, and of its influence on the learning process.
- Case studies and scenarios analysing user needs and user interactions with VLE platforms.
- Valuable feedback on reference models, specifications or service definitions within areas relevant to the e-Framework.

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<sup>7</sup> <http://jam.bbc.co.uk/>

### 3.5 Risks

The development scenario fits Lancaster's e-learning strategy (see appendix) and with the mix of e-learning platforms in use at Lancaster and across the different partnerships. To ensure that developments are relevant to e-learning and sustainable beyond the funding period, we will base the developments and their evaluation on the scheme outlined in the E-learning Maturity Model (eMM) for e-learning devised by Marshall and Mitchell (2004)<sup>8</sup>. This model provides an organisation (in this case consortium and other partnerships) with a framework and defined scale to:

- measure effectiveness in the processes that need to be reproduced and sustained and
- provide an overview to support management decision making over time.

Marshall and Mitchell's scheme provides a framework based on a categorisation of processes including Organisation, Evaluation, Coordination, Development and on processes that 'directly impact on the pedagogical aspects of e-learning', i.e. for measurement of capability to design, develop and deploy e-learning so that it meets the needs of students, staff and the organisation. The model is based on processes that can be measured by empirical evidence and which represent 'common truths' about e-learning capability. This approach is based on established Systems Engineering theory and practice and is an extension of the approach already accepted for monitoring development of the VLE at Lancaster. The eMM progression provides for movement from ad hoc processes (level 1) to a defined process for development and support (level 3), there are higher levels of development but they are beyond the scope of this proposal.

Text removed – Section 43 (Commercial Interests)

Technical development work (i.e. source code) relating to the use of mobile communications will be made available so will be readily portable to popular VLEs. It will be developed in a generic and modular fashion to avoid being bound to the Lancaster VLE. This way, it will be possible to utilise this software with other systems with little or no customisation. There is some risk that it won't be possible to produce toolsets that are universally applicable with other VLEs or that the news feeds (particularly if applicable to individual students) are not all usable by other partners, however we are aware of this and will seek to minimise such risks. A variety of systems are in use at Lancaster and in the partnerships so we will have ample opportunity and incentive to make systems as generic as possible.

While most of the development work will be on the back-end systems and interaction with mobile phones on the RSS side in particular we also hope to anticipate some requirements of Personal Learning Environments and will work towards making the Lancaster VLE compatible with and friendly towards developments in this area, such as the PLEX reference model by CETIS. Adherence to standards is vital and project systems will ensure conformance with the latest versions of appropriate protocols, particularly where these might support future implementations of Personal Learning Environments, for example Atom, FOAF, OPML etc. Where possible we will use standards based communication (e.g. web services, SOAP) with the information systems of partner institutions.

### 3.6 Value to JISC Community

The Project will seek to build relationships with other related activity in the sector, for example with CETLs such as the University of Wolverhampton's "Enabling Achievement within a Diverse Student Body" which also makes use of cutting edge communication technology, with HEA subject centres and the e-Learning Research Center.

We will seek to contribute to collections of case studies and scenarios such as included in the JISC booklet "Innovative Practice with e-Learning" and to map our activities within the JISC e-learning framework and particularly within the common services section (described at [www.elframework.org](http://www.elframework.org)).

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<sup>8</sup> Marshall, S.J. & Mitchell, G. (2004). Applying SPICE to e-Learning: An E-Learning Maturity Model? in Proceedings of the Sixth Australasian Computing Education Conference (ACE2004), Dunedin. Conferences in Research and Practice in Information Technology, Vol. 30. R. Lister and A. Young, Eds.

We aim to write for publications nationally and internationally in the areas of mobile learning (m-learning), flexible learning, widening participation and lifelong learning.

The Project will produce a variety of case studies with relevance to mobile learning, interaction of VLE and related systems across institutions, increased flexibility for students, improved e-administration and ultimately much improved support in these areas for untypical students in the lifelong learning and widening participation domains. Improved interaction between the VLEs and related systems of different institutions is a necessary step towards building easier progression and student mobility between HE and HE/FE institutions.

## 4 Budget

*A summary of the proposed budget which in broad outline identifies how funds will be spent over the life of the project.*

For the project to be able to achieve its ambition we request a grant of £193,145 to cover the following projected costs: (i) staff salaries for one full-time developer for two years, one implementer/tester for one year (between month 6 and month 18 during the pilot studies) and one senior developer at both Liverpool and Lancaster for the lifetime of the project in order to co-ordinate on interoperability issues and key technical challenges; (ii) a travel budget for fieldwork within collaborating institutions, attendance at JISC events and other travel for networking and dissemination purposes; (iii) a small equipment and consumables budget to provide the project with electronic consumables and communications technologies for the pilot phase and to provide the project with suitable development tools and a test server.

The project collaborators will add to the requested budget with in-kind contributions totalling £78,052. These will cover technical support and maintenance costs across the partners and cover dissemination and regional evaluation costs. The contribution also includes a total commitment from permanent members of staff of six person-months. This will include time commitments from Hennie Yip, who has worked as an e-learning developer and e-learning advisor for over 4 years at Lancaster University. Hennie will coordinate Lancaster VLE developments in collaboration with teaching staff as part of their exiting role as a contribution to this project. In addition the project will be able to leverage the CLEO consortium's investment in regional Moodle hosting and development work and further maximise impact and interoperability with other large scale systems.

	Grade	FTE	Cost	Comment
Project Direction	ALC 5	0.05	£2,369	<i>Contributed</i>
Project Management (Lancaster)	LEC B	0.32	£15,706	
Technical Support and Maintenance	ALC 3	0.5	£38,069	<i>Contributed</i>
E-Learning Advisor	ALC 3	0.2	£7,614	<i>Contributed</i>
Senior Developer (Liverpool)	ALC 4	0.05	£5,110	
Developer (Lancaster)	ALC 2	1	£65,767	
Implementer/Tester (Lancaster)	ALC 2	0.5	£29,906	
Senior Developer (Lancaster)	ALC 3	0.11	£5,123	
Travel, Equipment & Consumables			£10,000	
Dissemination Costs			£10,000	<i>Contributed</i>
Evaluation Costs			£20,000	<i>Contributed</i>
Indirect Costs			£114,797	
Total Full Economic Cost			£324,461	
<i>Contribution from Project Partners</i>			<i>£78,052</i>	
Total FEC minus partner contributions			£246,409	
80 % of Full Economic Cost			£193,145	

**Table 1: Summary of the Engage Project Costs**

## 4.1 Summary of Qualitative and Quantitative benefits

The following additional benefits of the Engage project will include:

- an analysis of costs and benefits for e-learning and for e-administration
- technical report including standards, interoperability and transferability issues

Evidence of

- cultural changes within the partner institutions in relation to portals, VLEs and mobile communication (phones, PDAs)
- changes in student behaviour
- sharing of best practice/new partnerships with other HEI's
- increase in the knowledge base of academic staff and students
- take-up of the project deliverables (source code and implementation plan)
- positive impact on student learning

## 5 Key Personnel

*Names and brief career details of staff expected to contribute to the project*

Key Personnel, both funded and contributed to the project, will include:

**Dr Nicholas Race**, Head of Network Research and Special Projects Unit, (NRSP), Information Systems Services (ISS), Lancaster University.

**Dr Keith Mitchell**, Senior Developer, Network Research and Special Projects Unit, (NRSP), Information Systems Services (ISS), Lancaster University

**Dr Duncan McCaffery**, Developer, Network Research and Special Projects Unit, (NRSP), Information Systems Services (ISS), Lancaster University

**Dr Paul Rodaway**, Director: Centre for Learning & Teaching, Lancaster University

**Mr Mark Bryson**, Team leader, Learning Technology Group (LTG), Lancaster University.

**Mr Zhen Cai**, Developer, Centre for Learning & Teaching, Lancaster University

**Hennie Yip**, E-learning Advisor, Learning Technology Group, Lancaster University

**John Smith**, Director of Medical Studies, University of Liverpool

**Martin Ralph**, IT Support Unit, Faculty of Medicine, University of Liverpool

**Jake Gannon**, Groupware Team Leader, University of Liverpool

**Prof. Barry Forde**, Cumbria and Lancashire Education Online

**Dr Adrian Woolard**, R & D Executive, BBC Creative R&D, New Media & Technology

## 6 Contact

**Dr Nicholas J. P. Race**

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## **7 Appendix A - Letters of Support**



22 June 2006

Ann Lloyd  
JISC Executive  
Northavon House  
Coldharbour Lane  
Bristol  
BS16 1QD

Dear JISC

**JISC Circular 3/06: Appendix C *Cross-institutional use of e-learning to support lifelong learners***

I am writing to express this University's strong support for the "Engage" proposal to this programme. Lancaster University has a strong commitment to the development of and researching into the use of virtual learning environments. Lancaster's institutional Learning Teaching and Assessment strategy and institutional e-learning strategy commit the University to extend and embed e-learning across all programmes, and this proposal will accelerate development of existing undertakings. The proposal will enhance the integration of mobile technologies and VLEs in different institutions and underlines the University's commitment to regional collaboration.

I wholeheartedly commend the University's participation in this project.

Yours sincerely

Professor Trevor McMillan  
Pro-Vice-Chancellor for Research

Lancaster University  
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United Kingdom

Telephone (01524) 592054  
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22<sup>nd</sup> June, 2006

Dear JISC

I am writing to express this University's strong support for the "Engage" proposal to this programme. Lancaster University has a strong commitment to the development of lifelong learning and researching into, and use of virtual environments, which includes developments to enhance lifelong learning. This has been illustrated by its investment in Lancaster University's new School of Lifelong Learning and Widening Participation which took place in December 2005.

Lancaster's institutional Learning Teaching and Assessment strategy and institutional e-learning strategy commit the University to extend and embed e-learning across all programmes, and this proposal will accelerate development of existing undertakings. The proposal will enhance the integration of mobile technologies and VLEs in different institutions and underlines the University's commitment to regional collaboration.

The Lancaster VLE already supports a large number of courses operated by our School of Lifelong Learning and this proposal will greatly enhance the utility of the Virtual Environment for lifelong learners.

I wholeheartedly commend the University's participation in this project.

Yours faithfully,

Dr. P. Sawyer  
Acting Head of Department



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*of* LIVERPOOL

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18 August 2006

Dear Ruth,

The ENGAGE project

We are delighted to provide this formal letter of support for the ENGAGE project.

For many years, and in common with all medical schools, we have been attempting to find ways of providing useful and timely information to students on flexible timetables, and especially those who are placed in hospitals away from the main University hub. We see the merit of this project in using current and developing technology to overcome this particular difficulty, and provide a new dimension to studying medicine. I personally see a clear advantage in using technology which is accessible and familiar to all students. As I understand it, the bid complements and extends our own University's work on a student portal. The outcomes of the project will be of very real value to us, and I am sure will be transferable to other programmes of study throughout the sector.

We are certainly willing to offer our support to the project, and will encourage our students to take advantage of the system during its development phase, and hopefully beyond.

Yours sincerely,



21<sup>st</sup> June 2006

Ann Lloyd  
JISC Executive  
Northavon House  
Coldharbour Lane  
Bristol  
BS16 1QD

**JISC Circular 3/06: Appendix C**

Dear JISC,

I am writing to express CLEO's strong support for the Engage proposal.

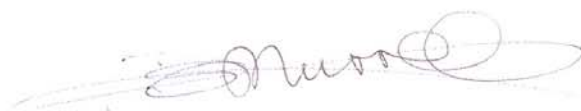
Cumbria and Lancashire Education Online (CLEO) is one of 10 English Regional Broadband Consortia (RBCs) and is made up of Cumbria County Council and Lancashire County Council. Originally formed in 1998, the CLEO broadband network is working towards broadband provision for all schools across Cumbria & Lancashire and supporting the use of broadband technology in the classroom.

CLEO is investing heavily in the provision of Virtual Learning Environments, and is required by the DfES to deliver VLEs for all 1000 primary and secondary schools in the region by 2008. Furthermore, it has allocated in the region of £0.5million to deliver VLE solutions (based around the Moodle platform) during this financial year, with additional investment likely to complete the roll-out by 2008.

The proposal's work in enhancing the integration of mobile technologies and investigating issues of progression is vital to the success of learning environments for lifelong learners. We view the work as having the potential for a significant contribution into the educational sector.

CLEO would therefore like to express its' support for this project.

Yours faithfully,



Deborah Murrell  
**CLEO Project Manager**  
Lancashire County Council



**New Media & Technology | Creative Research & Development**

**To whom it may concern**

I am happy to say that Creative R&D on behalf of BBC New Media & Technology are pleased to confirm an expression of interest in your proposed project.

The Engage project is an exciting project with a great potential. The current work at BBC Learning through services such as the recently launched BBC jam and its focus on accessibility and supporting Special Educational Needs highlights our interest in the area. The Engage project shows great potential in the area of mobile technology integration within interactive learning and would provide active engagement in learning that moves beyond the current paradigms.

The BBC would like to participate in an active reference group/project group, and we see our role as being that of sharing knowledge, participating in concept generation and commenting on results.

We hope the project will be funded and look forward to working together with you and the partners. Thanks again for approaching the BBC and here's hoping that this proposal is successful.

Yours faithfully,

Dr Adrian Woolard, R & D Executive  
BBC Creative R&D, New Media & Technology

## 8 Appendix B – Regional University Collaboration

### Lancaster University's collaboration with the University of Liverpool

Lancaster University was a partner in the University of Liverpool's bids for additional medical student numbers in 1999 and 2001, which resulted in 90 new places. Lancaster's role was to provide Special Study Modules and opportunities for intercalated masters degrees in areas of the sciences, social sciences, statistics and management with relevance and application in the medical curriculum. Lancaster has distinctive research and teaching strengths in these areas which complement Liverpool's biomedical offerings. The University Hospitals of Morecambe Bay NHS Trust was also a partner in these bids, and has worked with Liverpool over the last few years to establish increasing numbers of high quality practice placements in its hospitals in Lancaster, Barrow and Kendal, and the community in the Morecambe Bay area. The Trust currently provides SSMs, clinical placements for Year 4 students, and community modules and Selectives in Advanced Medical Practice (SAMPs) for final year students.

The Cumbria and Lancashire Medical and Dental Consortium (consisting of the University of Liverpool, Lancaster University, St Martin's College and the University of Central Lancashire) was recently successful in its bid to HEFCE and the Department of Health to expand undergraduate medical education in Cumbria and North Lancashire. The University of Liverpool has been awarded an additional 50 places from September 2006 for students to study the full five years in the region, with Lancaster University as their academic base. These students will be admitted to a discrete route following the internationally acclaimed Liverpool MBChB programme, with their clinical experience based in the University Hospitals of Morecambe Bay NHS Trust and in Morecambe Bay Primary Care Trust. The bid was conceived in response to the *Review of higher education provision in Cumbria* (the Fender Report, 2003) as a way of developing the provision of undergraduate medical education in Cumbria and North Lancashire, which in turn will address NHS recruitment and retention problems in the area (as locally trained medical graduates often settle where they trained).

The students will be based on the University campus, where facilities will include a Clinical Anatomy Learning Centre. A Clinical Skills Centre will be provided at the Royal Lancaster Infirmary. The University of Central Lancashire and St Martin's College will deliver Special Study Modules (SSMs) in their specialist areas, and will contribute to areas of interprofessional education.

The University of Liverpool will be responsible for the curriculum and for quality assurance. A Management Board representative of all the HEIs and NHS partners will manage the collaboration, and from this foundation the Consortium will aim to be in a position to bid to expand undergraduate medical education in Cumbria and Lancashire in any future exercise to increase medical student numbers. This would ideally result in an intake of 100-120 by 2009-10.

Lancaster University has recently set up the Centre for Medical Education (Director Professor Anne Garden), which is part of the Faculty of Science and Technology. The Centre will form the base for Lancaster's activity in undergraduate and postgraduate medical education and its partnership with the University of Liverpool and others, and will complement and strengthen the research activity of the other Lancaster departments which are involved in health and medical fields. It will be the conduit for liaison with the local NHS Trusts, who are keen to develop closer links; these could take the form of joint and honorary appointments, and possibly a physical presence for the University at a Trust site(s).

## **9** Appendix C - E-Learning at Lancaster

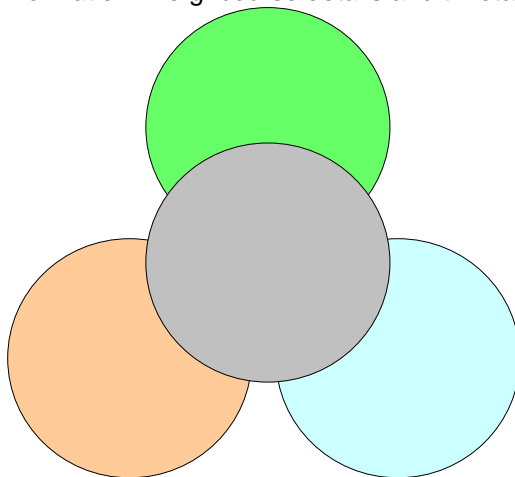
Text removed – Section 43 (Commercial Interests)

## 10 Appendix D – A Stepped Threshold Implementation Model

The threshold model situates eLearning within the broader concept of University ICT systems supporting the student learning experience<sup>9</sup>. On-going developments in learning and teaching practice, and technology, mean that the specific detail within each step will change over time, but the *broad framework provides a structure and direction, adaptable to local circumstance but contributing to greater coherence in the overall student learning experience.*

The model is a matrix defined in terms of three progressive levels or thresholds, and three interrelated and mutually reinforcing categories:

- Resources – e.g. access to course content, reading lists, and wider information resources
- Interaction & Communication - e.g. learning activities such as online seminars, eAssessment, and personal development planning
- Organisational Information – e.g. course details and timetables



The three threshold levels or steps identify a developmental path:

- **Minimum/Introductory** - the minimum standard readily achievable now for all programmes of study. This defines what all students should expect as part of their eLearning experience at Lancaster University. *Here the focus is primarily on the provision of online resources to complement existing provision, and levels of online interaction and collaborative learning tend to be limited to email, some coursework submission and basic use of discussion forums.*
- **Intermediate/Contextual** - development & embedding into local TLA practices & customisation to specific disciplines. Over an agreed period all programmes should achieve this threshold. This level defines what students should expect by an agreed date within a specific programme of study (or group of programmes). *Here eLearning practices will in some cases substitute for existing face to face practices, and greater utilisation is made of the facility of eLearning tools to support cooperative and collaborative learning.* This level can include greater use of online assessment, reflective logs and online seminars, for instance, as well as discipline specific packages and tools. There will be common pedagogical features and equivalence, but also some variety as appropriate to context.
- **Advanced/Transformational** - significant shift in pedagogical practice and greater requirement for technical infrastructure and development. In the short/medium term this threshold will be a target only for certain agreed programmes of study. *Here eLearning tools realise learning opportunities not readily possible any other way – e.g. video-conferencing technologies to support collaborative learning across significant distances*

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<sup>9</sup> Some strategies equate eLearning only with VLEs and neglect the important role of wider ICT to support the student learning experience –Library, Student Information Systems (such as LUSI) & multimedia technologies.

*or for integrating work-based and campus based learning, the utilisation of simulation models and game scenarios to provide more realistic modelling of real-world situations for learning.*

Currently, for most programmes of study the provision of eLearning is at or close to the minimum threshold. A growing number of programmes are however now embedding eLearning more fundamentally into their learning and teaching practice, leading to elements of substitution and transformation<sup>10</sup>. *The threshold model is focussed on the student learning experience as defined wholistically at the programme level.* The model recognises that in a pedagogically driven approach to eLearning, which recognises discipline specific context and the value of a blended learning approach, the appropriate application of eLearning will vary between modules (and programmes) *but* this needs to be balanced against the expectations of greater consistency and enhanced quality of learning opportunities for all Lancaster students.

### Threshold Matrix


<sup>10</sup> During 2005-06, HEFCE eLearning Strategy funding has supported a wide range of projects across Lancaster University to further develop and embed eLearning: see <http://www.lancs.ac.uk/users/celt/elearning/>.

## 11 Appendix D – CV's for Key Personnel

*Dr Nicholas John Paul Race*

(DoB 01.08.75)

### QUALIFICATIONS

1993 – 1996 BSc Computing (1<sup>st</sup> Class Hons.), Lancaster University  
1996 – 2000 PhD Computing, Lancaster University

### EMPLOYMENT

1998 – 2000 Research Assistant (Part-Time), Department of Computing,  
Lancaster University  
2000 – 2001 Research Associate, Department of Computing, Lancaster  
University  
2001 – 2003 Research Lecturer, Department of Computing, Lancaster  
University  
2003 – Lecturer & Head of Network Research and Special Projects Unit,  
Lancaster University

### RESEARCH SUPERVISION

Currently supervising 3 PhD students.

### AWARDS

Lancaster University Staff Commercialisation Prize (2003)  
Lancaster University Staff Community Prize (2005)

### SELECTED RESEARCH GRANTS

2003 – 2005 EU: Enthroned – End-to-End QoS through Integrated Management  
of Content, Networks and Terminals  
2004 – 2006 EU: E-NEXT – Emerging Networking Experiments and  
Technologies  
2004 – 2007 EPSRC: Towards an Autonomic Content Distribution  
Infrastructure [£250k] *Grant No:* GR/S70272/01

### SELECTED PUBLICATIONS

Mitchell, K., Race, N.J.P., *uLearn: Facilitating Ubiquitous Learning through  
Camera Equipped Mobile Phones*, Proceedings of the IEEE International  
Workshop on Wireless and Mobile Technologies in Education (WMTE 2005),  
Tokushima, Japan.  
Mitchell, K., Race, N.J.P. and Clarke, M., *CANVIS: Context-Aware Network  
Visualisation using Smartphones*, Proceedings of the 7th International  
Conference on Human Computer Interaction with Mobile Devices and  
Services (MobileHCI 2005), 19-22 September, 2005, University of Salzburg,  
Austria.

- Mitchell, K., Race, N.J.P. and Forde, B., *If You Build it, They Will Come*, Proceedings of International Workshop on SASO+STEPS 2005 (Software Architectures for Self-Organization and Software Techniques for Embedded and Pervasive Systems) in conjunction with Pervasive 2005.
- Mitchell, K., Race, N.J.P. and Suggitt, M., *iCapture: Facilitating Spontaneous User-Interaction with Pervasive Displays using Smart Devices*, PERMID 2006: Pervasive Mobile Interaction Devices Workshop at Pervasive 2006, May 2006, Dublin, Ireland.
- Mitchell, K. and Race, N.J.P. *Oi! Capturing User Attention Within Pervasive Display Environments*, Pervasive Display Infrastructures and Applications Workshop at Pervasive 2006, May 2006, Dublin, Ireland.
- Denney, J.C. and Race, N.J.P., *Swarm: A Multimedia Delivery Network for Highly Dynamic Networking Environments*, Proceedings of the ACM 12th Annual Multimedia Computing and Networking (MMCN'05), January, 2005, San Jose, California
- Race, N.J.P. and Eccles, S., *Content Distribution Networks and End-to-End Quality of Service Guarantees*, Broadband Europe, Bruges, December 2004.
- Denney, J.C. and Race, N.J.P., *Dynamic system adaptation in a wireless-aware media streaming architecture*, Proceedings of the IEEE 3rd International Conference on Networking (ICN'04), Guadeloupe, French Caribbean, March 2004, p454-9.
- Brampton, A., MacQuire, A., Rai, I., Race, N.J.P. and Mathy, L., *Stealth Distributed Hash Table: Unleashing the Real Potential of Peer-to-Peer*, Proceedings of the 2005 ACM Conference on Emerging Network Experiment and Technology, CoNEXT 2005, October, 2005, Toulouse, France, ACM Press, New York, pp. 230-231
- Plagemann, T., Goebel, V., Griwodz, C., Halvorsen P., Mathy, L., Race, N.J.P., Zink, M., *Towards Scalable and Affordable Content Distribution Services*, 7th International Conference on Telecommunications, 11-13th June 2003, Zagreb, Croatia.
- Race, N.J.P., Waddington, D. and Shepherd, D., *An Experimental Dynamic RAM Video Cache*, Proceedings of Network and Operating Systems Support for Digital Audio and Video (NOSSDAV'2000), 26-28 June 2000, Chapel Hill, North Carolina.

**Dr Keith Mitchell**

(01.07.1975)

**QUALIFICATIONS**

- 1991 – 2001 PhD Computing, Lancaster University, UK.  
Thesis Title “*Systems supporting for mobile context-aware applications*”
- 1994 - 1997 First class BSc Computer Science with Software Engineering,  
Lancaster university, UK

**EMPLOYMENT**

- 2003 – present Research, Network Research and Special Projects Unit (NRSP),  
Lancaster University
- 1997 – 2003 Research Associate, Computing, Lancaster University

Keith has been a research within the are of mobile and ubiquitous computing since 1997. He worked initially on the EPSRC funded GUIDE Project before managing the Real Tournament applications development as part of the industrially sponsored Mobile IPv6 Systems Research Lab in close collaboration with Cisco Systems, Microsoft Research and Orange. He was awarded his PhD in March 2002 for his research into supporting the development of mobile context-aware applications. His research interests fall broadly into the areas of human-computer interaction; context-aware computing; mobile and ubiquitous computing. His current research interests relate to the use of smart devices and large public displays within ubiquitous computing environments. More specifically, the use of Smart devices for enabling novel multimedia and interactive educational applications and services.

**SELECTED PUBLICATIONS**

- iCapture: Facilitating Spontaneous User-Interaction with Pervasive Displays using Smart Devices, Keith Mitchell, Nicholas J. P. Race and Michael Suggitt, in Proceedings of Workshop on Pervasive Mobile Interaction Devices (PERMID), a Workshop at Pervasive 2006, Dublin, Ireland.
- Oi: Capturing User Attention Within Pervasive Display Environments, Keith Mitchell and Nicholas J.P. Race, in Proceedings of Workshop on pervasive display infrastructures, interfaces and applications, a Workshop at Pervasive 2006, Dublin, Ireland
- uLearn: Facilitating Ubiquitous Learning through Camera Equipped mobile phones, Keith Mitchell and Nicholas J. P. Race (UK), Mitchell, K., Race, N. J. P., Clarke, M., in Proceedings of IEEE International Workshop on Wireless and Mobile Technologies in Education (WMTE 2005), Japan.
- CANVIS: Context-Aware Network Visualisation using Smartphones, Mitchell, K., Race, N. J. P., Clarke, M., in Proceedings of 7th International Conference on Human Computer Interaction with Mobile Devices and Services (MobileHCI 2005), 19 to 22 September 2005, Austria.
- Six in the City: Introducing Real Tournament: A Mobile IPv6 Based Context-Aware Multiplayer Game, Mitchell K., McCaffery, D, Metaxas, G., Finney J.,

- Proceedings of NetGames 2003, May 22-23, at Electronic Arts Headquarters Redwood City, California.
- Exploring Context-Aware Information Push, Cheverst K., Davies N., Mitchell K. and Smith P., Proceedings of Third International Workshop on Human Computer Interaction with Mobile Devices (Mobile HCI), 10 Sept 2001,
- Using and Determining Location in a Context-Sensitive Tour Guide, Davies, N., Cheverst, K., Mitchell, K. and Efrat, A., Appeared in IEEE Computer Journal, August 2001 (Vol. 34, No. 8)
- Experiences of Developing and Deploying a Context-Aware Tourist Guide: The GUIDE Project, Cheverst K., Davies N., Mitchell K. & Friday A., Proceedings of MOBICOM'2000, Boston, ACM Press, August 2000, pp. 20-31.
- Exploiting Context to Support Social Awareness and Social Navigation, Cheverst, K., Mitchell, K., Smith, G., Davies, N., in Proceedings of the Workshop on 'Awareness and the WWW' at CSCW '00, Philadelphia, 2nd Dec 2000.
- Developing Context-Aware Electronic Tourist Guide: Some Issues and Experiences, Cheverst K., Davies N., Mitchell K., Friday A. and Efstratiou C., Proceedings of CHI'2000, Netherlands, (April 2000), pp. 17-24.
- Caches in the Air: Disseminating Tourist Information in the Guide System Davies, N., Cheverst, K., Mitchell, K. and Friday, A., In Second IEEE Workshop on Mobile Computer Systems and Applications, New Orleans, Louisiana, 25-26 February 1999.

**Dr Paul Rodaway**  
**Director: Centre for Learning & Teaching, Lancaster University.**

Centre for the Enhancement of Learning and Teaching (CELT) incorporates the Learning Technology Group which provides technical and pedagogical development support for online learning at the University. Prior to joining the University in January 2006, Dr Rodaway was Director of the Centre for Learning & Teaching, University of Paisley, Director of the SFC-ISLE Project (consortium), and Paisley project leader for the Nottingham University 'Specifying an ePortfolio' JISC-MLE Project.

He has particular project experience in VLE and ePortfolio development, and large scale FE/HE collaborative projects, and expertise in the pedagogical application and organisational management of ICT applications for widening access to learning opportunities.

# Duncan McCaffery

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I have extensive research expertise within the areas of mobile, Computer Supported Cooperative Work (CSCW) and distributed event-based computing. My research during the past four years has been conducted within the University of Lancaster's Distributed Multimedia Research Group (DMRG), an international research centre of excellence within these areas.

## Academic Qualifications

B.Sc. Computer Science, University of Lancaster, 2000.

## Employment History

### Research Assistant

Oct 2005 – Jan 2006, Computing Department, Lancaster University, UK

## Teaching

During my time within the Computer Science department, I have gained further teaching experience through the marking of assessed course work, taking part in practical class supervision and teaching tutorial sessions. My commitments for teaching and tutoring the first year computing courses amount to 480 hours over 4 years. Much of this was focused around the teaching of Java programming, although the course is also quite broad in its treatment of computer science fundamentals such as algorithms and data structures, systems architecture and software engineering. During my time as a first year tutor I was responsible for a group of approximately 25-30 students. Every week practical sessions would take place for two hours with all students present, while two further tutorial sessions took place for one hour each with approximately half of the class.

In addition to teaching first year courses I have had further experience in teaching a second year Microsoft .NET based course during the summer terms of both the 2001/2002 and 2002/2003 academic years. This five week course was taught in two hour blocks and lead by Dr. Keith Mitchell who provided an introductory overview lecture on the topics covered during the sessions. The rest of the session consisted of practical learning exercises that were supervised by both Dr. Mitchell and I.

## Publications Record

“Low Latency Optimisation of Content Based Publish Subscribe for Real-Time Mobile Gaming Applications”, Duncan McCaffery and Joe Finney, Proceedings of the Fourth International Workshop on Distributed Event-Based Systems in association with the 25<sup>th</sup> International Conference on Distributed Computing Systems, Columbus, Ohio, USA, 10<sup>th</sup> June, 2005.

“The need for real time consistency management in P2P mobile gaming environments”, Duncan J. McCaffery and Joe Finney First ACM SIGCHI International Conference on Advances in computer entertainment technology, Singapore, July 2004.

“Gaming, Fine Art, and Familiar Strangers”, Duncan McCaffery, Joe Finney, Stefan Schmid and Andrew Scott, IEEE Pervasive Magazine (Vol. 3, No. 1), January – March 2004

“Peer-to-Peer: Our Mobile Real-time Saviour?” Duncan McCaffery and Joe Finney, 8<sup>th</sup> CaberNet Radicals Workshop, Ajaccio, Corsica, 5th - 8th October 2003.

“A Mobile Context-Aware Game for the Next Generation”, Maomao Wu, Keith Mitchell, Duncan McCaffery, Joe Finney and Adrian Friday, 2nd International Conference on Application and Development of Computer Games, City University of Hong Kong, HKSAR, January 2003.

“Six in the City: Introducing Real Tournament: A Mobile IPv6 Based Context-Aware Multiplayer Game”, Keith Mitchell, Duncan McCaffery, George Metaxas, Joe Finney, Stefan Schmid and Andrew Scott, Second ACM Workshop on Network and System Support for Games, Electronic Arts Headquarters Redwood City, California, 22-23 May, 2003.

**Skills**

I have practical experience in developing systems and applications using a wide range of programming languages and developer APIs. These include: C# (.NET Standard and Compact frameworks), Java, C/C++, COM, .NET Web Services, Python, SQL, HTML and CSS. Furthermore, I have experience in developing for the following platforms: Win32, Windows CE, PocketPC, and Linux.

**Personal Interests**

Outside of my academic interests I enjoy taking part in a number of activities. I am an active member of the university scuba diving society and am currently in the process of taking my BSAC Sports Diver qualification. I am also interested in martial arts and am currently training in Jujitsu. In addition I enjoy cycling, swimming and a few less energetic activities such as cinema and language learning.

**Zhen CAI**

1 Jedburgh Road  
London, E13 9LQ  
United Kingdom

Email: z.cai@lancaster.ac.uk Phone: +442085521049 Mobile: +447921683687

**OBJECTIVE**

To obtain a challenging position within the Information technology field which would best utilize my expertise in various programming, mathematical and information management techniques.

**SKILLS**

**PROGRAMMING:** Java/J2EE, C/C++, Perl, XML, XSLT, xlib, TCL/TK, Matlab, OpenGL, etc.

**DATABASES:** Lotus Domino, SQL, Excel, etc.

**OPERATING SYSTEMS:** Windows Platforms, Linux, UNIX/Solaris, Mac OS

**TOOLS:** Lotus Notes Suite, JBuilder, Eclipse, Photoshop, Dreamweaver, Filemaker

**EDUCATION**

**QUEEN MARY, UNIVERSITY OF LONDON, LONDON, U.K.** 9/2004 – 12/2005

**MSc in Information Management, with Distinction**

**MAIN COURSES**

- Information Retrieval
- XML and Structured Information
- Interactive System Design
- Multimedia

**UNIVERSITY OF WATERLOO, WATERLOO, ONTARIO, CANADA** 9/1999 – 6/2003

**Bachelor of Mathematics, Honours Computer Science**

**MAIN COURSES**

- Computer Graphics
- Information Management
- User Interfaces
- Artificial Intelligence
- Operating Systems
- Multi-threaded programming
- Digital Design
- Assembly Language and Compilers

**KING EDWARD VII SCHOOL, SHEFFIELD, U.K.** 9/1997 – 8/1999

**A-Level**

- Mathematics
- Physics
- Chemistry

**PROJECTS**

**INTELLIGENT ENTERPRISE EMAIL SEARCH**

- Completed as my MSc thesis, results submitted to TREC (Text Retrieval Conference – the most important information retrieval research event in the world for decades)
- Built the system to search through 5GB of W3C (World Wide Web Consortium) email archive, with a complete web-based GUI
- Incorporated technologies such as Perl, Unix Shell Script, Java/J2EE, HTML, HySpirit, etc.
- Involved new research topics which involve "Expert Search/Identification" that searches for "Experts" in an enterprise environment using only email archives

**WEB SEARCH ENGINE**

- Created to search over 1000 WebPages, and indexed with an indexing tool written in Perl.
- Designed a web-based GUI, created in Java/J2EE and HTML

**SMART STOCK TRADER**

- Programmed in Matlab using the artificial intelligence theory of probabilistic reasoning and learning systems
- Designed to making short-term stock trading decisions, based on the historical stock data, and cumulating data learned by the system to improve future decisions

**3D PINBALL GAME**

- Written in C++ using OpenGL libraries, and completed with a GUI written in TCL/TK

**RELATIONAL DATABASE SYSTEM**

- Used Filemaker for data storage, and Tango Pro Server
- Written a web-based data query GUI in HTML

**WORK**

CENTRE FOR ENHANCED LEARNING AND TEACHING, LANCASTER UNIVERSITY, U.K.

**Learning Technology Support Officer, 3/2006 – Present**

- Part of the learning technology group, which is responsible for developing and maintaining LUVLE (Lancaster University Virtual Learning Environment)
- Researched and developed a SMS service within LUVLE, which allows authorized user to broadcast important information via SMS messaging from the LUVLE website

OPEN DISTANCE LEARNING UNIT, UNIVERSITY OF LONDON, U.K.

**Online Mentor, 12/2004 – 12/2005**

- Working with a team of tutors, teaching assistants and mentors
- Responsible for helping and motivating distance learning students

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF LONDON, U.K.

**Teaching Assistant, 1/2005 – 5/2005**

- Responsible for presenting, supervising and assessing undergraduate lab works for "Network System Architecture"

**VOLUNTEER**

WATERLOO CO-OP STUDENT RESIDENCE INC, WATERLOO, ONTARIO, CANADA

**Board of Directors, 8/2002 – 12/2002**

- Responsible for making major financial decisions within the organization, including long term budget planning, allocating money for major projects
- Responsible for hiring staff, evaluating the division managers and addressing member concerns
- Proposed major changes to the "Judicial Policy" to reflect changes in the organization, and the proposed changes later approved by the general members

WATERLOO CO-OP STUDENT RESIDENCE INC, WATERLOO, ONTARIO, CANADA

**Assistant Division Manager, 1/2002 – 2/2002**

- Responsible for assisting the Division Manager to ensure the health and safety of all the members living in the division

CHINESE STUDENT AND SCHOLAR ASSOCIATION, SHEFFIELD, U.K.

1/1999 - 8/1999

**Computer Consultant, 1/1999 – 8/1999**

- Responsible for trouble-shooting technical problems encountered during the making of the electronic publication of the "Shaffield" Magazine

**ACTIVITIES**

pencil sketching, clay sculpting, culinary art, swimming, squash, badminton, football

**NOTE**

I am a permanent resident of the U.K. therefore I am fully eligible to work in the U.K. without a work permit