

# HCI for Technology Enhanced Learning

Willem-Paul Brinkman,  
Charles van der Mast  
Delft University of Technology  
Mekelweg 4  
2628 CD Delft, The Netherlands  
{w.p.brinkman,  
c.a.p.g.vandermast}@tudelft.nl

Annette Payne  
Brunel University  
Uxbridge, Middlesex UB8 3PH, UK  
annette.payne@brunel.ac.uk

Joshua Underwood  
London Knowledge Lab, IOE  
23-29 Emerald Street  
London WC1N 3QS, UK  
j.underwood@ioe.ac.uk

## ABSTRACT

The involvement of technology to support and enhance learning is ever increasing; for example moving from the traditional blackboard to electronic whiteboards, from printed books to virtual reality training simulations, and from class room meetings to (a-)synchronised meeting over the web with handheld mobile devices. These technologies promise improved efficiency for traditional ways of learning or even to open up totally new ways of learning. Designing technology-enhanced learning that engages learners in successful learning strategies requires an understanding of the learning context, learners' needs, motivations, habits and desires as well as ease of use. This workshop invites researchers, designers, and educators to discuss their work in this area and explore how HCI practices and methods can be applied or should be extended.

## Categories and Subject Descriptors

K.3 [Computers and education]: Computer Uses in Education – *collaborative learning, computer-assisted instruction (CAI), computer-managed instruction (CMI), and Distance learning*

## General Terms

Design and Human Factors.

## Keywords

e-learning, computer assisted training, computer assisted assessment, educational technology, learner centred design.

## 1. INTRODUCTION

We are arguably moving from the information age to the knowledge age. As computer scientists we need to embrace the challenges this shift presents. For example, the internet offers a wealth of information to facilitate learning both in its content and as a tool for delivery. The harnessing of this information and the technology to assist learning needs informs design of e-learning applications. This is of particular interest to non standard learners who's lifestyle or circumstances prevent them enrolling on traditional courses and self directed learners. Additionally development of new hardware provides an ever increasing plethora of tools to facilitate learning. With every new technology new opportunities to support learning are seen:

campuses are built in Second Life, ubicomp enables technology enhanced learning in context, mobile phones are seen as tools to support learning anytime anyplace, reality can be augmented for learning, abstract concepts can be made more tangible and with Web 2.0 some perceive the opportunity for a more participatory form of Learning 2.0. As new technologies are deployed to support traditional and new ways of learning to what extent do the challenges to designers of interaction for learning remain the same and how do they change? Are there tensions between designing for ease of use and depth of learning? Is entertaining learners as important as or more so than challenging them cognitively? Who should be involved in user centred design of learning (teachers, learners, others) and how best can they be involved? E-learning technologists have in the past felt duty bound to prove that their technology is superior to traditional or pre-existing methods of teaching. With the spread of e-learning in the workplace and the recreational arena as well as in schools and academia what evaluation and success criteria should be applied to e-learning strategies? The development of technology to enhance learning seems to follow two models: the *improvement model* where technology support traditional learning, for example, online text books to replace paper text books; or the *create model* where technology creates an new type of learning experience, for example, a computer simulations world in which people can experience and experiment with working in a team to manage and build an international harbour. Arguments for the first model can be related with a drive to improve efficiency and effectiveness, such as reducing workload of the teacher, or making learning more accessible for learners. When such objectives are clearly identified they will lead to evaluation criteria and may indicate the relative importance of engaging with different types of users and other stakeholders in the design process. The second model aims at giving learning a new dimension. When technology is used to explore the frontiers of learning and open up novel opportunities for creating knowledge it may prove much more difficult to establish evaluation criteria and to identify and engage appropriately with stakeholders at the design stage. Of course combinations of these models are possible and exploring a range of user-centred and participatory design methods that may be used across the full range of technology enhanced learning opportunities seems appropriate.

## 2. HCI2007 WORKSHOP

This workshop builds on last year's workshop, which had the title: *Design, Use and Experience of E-Learning Systems*. Eight submissions were presented and discussed at the workshop. The diversity of these submissions illustrates the wide range of research in this area. For example, Brinkman 6 started the workshop by discussing research on a simulation environment where students experience what it is to discuss ethical issues in an ethics committee. This was followed by Griffin 6 who also talked about learning (bio)ethics, except in the context of online

© The Author 2008.

Published by the British Computer Society

discussion board. After this, the discussion moved from ethics to inclusion. Read's 6 presentation of the Cool Project focussed on involving pupils that are excluded from mainstream high school in the design of education technology to help them learn about their emotions and their behaviour. She discussed how the use of technology helps her to achieve this. These presentations illustrate that technology can create new learning possibilities, as did the presentation of Smith and Underwood 6 on how technology can link school science with real world science to build a new kind of science learning community. Technology can also help to improve more established kinds of learning as was illustrated by the presentation of Griffin 6 on computer-based assessment with formative and summative feedback, and Payne's 6 presentation on effective feedback styles in e-learning packages. Looking beyond technology enhanced performance in learning, de Lera 6 argued in her presentation that we also need a methodology and guidelines to design for *the joy of e-learning*. Most of the papers addressed curriculum driven learning needs, but Rizvi 6 account of an e-learning system designed to deliver to the learning needs of telecoms engineers in the field illustrated some of the issues involved in design for work-based and life long learning.

### 3. HCI2008 WORKSHOP FOCUS

Last year's HCI2007 workshop focused on the intersection of HCI and e-learning systems and especially on new developments in this area such as: designing for inclusion, personalisation, blended learning, and consistency in computer assisted marking. Although submission on these topics are still welcome, this year's workshop will especially welcome submissions from the full-range of technology enhanced learning opportunities, possible topics include but are not limited to:

- ❑ The design of learning using novel technologies such as VR, AR, mobile learning and games for learning.
- ❑ Design guidelines and patterns for e-learning and computer assisted assessment
- ❑ Research methods to study the design, learnability, and use of learning technology
- ❑ Case studies on the learner's experience of new learning technologies
- ❑ The design of personalised and adaptive learning technology
- ❑ E-learning tools such as video, quizzes, discussion board and dynamic voting.
- ❑ Designing Web 2.0 for learning
- ❑ Issues in designing tangible technologies for learning
- ❑ Issues in designing for lifelong learning, unusual types of learners, learners and teachers
- ❑ Designing Open Learning Technologies

The workshop intends to attract researchers, designers, and educators that are interested in understanding good design and the learner experiences of learning technology, both the hardware and the software element. Workshop participants could come from a variety of backgrounds such as HCI, psychology, design, and education. The main objective of the workshop is to establish a community of individuals with an interest in this area, allowing a lively exchange of ideas with the aim of supporting the research of the workshop members. People that are considering to make a submission are encourage to visit the website<sup>1</sup> or to the consult the proceedings 6-6 of last year's workshop to familiarize themselves with contributions of last year.

<sup>1</sup> <http://disc.brunel.ac.uk/HCI2007elearningworkshop>

### 4. WORKSHOP FORMAT

The workshop is schedule for the entire day, and will run as a series of presentations followed each time with an in depth discussion. The format is simple and straightforward aiming at supporting the research of the individual workshop member by discussing their work in a group setting, without having a goal of establishing an overall workshop outcome. Members are encouraged to demonstrate their learning technology as they present their research. After the workshop, position paper, slides and minutes of the discussion will be published in the proceedings of the workshop. Drafts of the position paper will be placed on the workshop website<sup>2</sup> before the workshop day.

### 5. WORKSHOP COMMITTEE

**Willem-Paul Brinkman** and **Charles van der Mast**, Delft University of Technology, The Netherlands

**Annette Payne** and **Julia Stephenson**, Brunel University, UK,  
**Darren Pearce** and **Joshua Underwood**, London Knowledge Lab, University of London, UK

**Enric Mor Pera**, Universitat Oberta de Catalunya, Spain

**Hilary Smith**, University of Sussex, UK

### 6. REFERENCES

- [1] Griffin, D.A. Delivering a bioethics module through online assessment and feedback: an electronic approach that is preferable to assessment of face-to-face discussion. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 17-23.
- [2] de Lera, E., and Mor, E. The joy of e-learning: redesigning the e-learning experience. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 85-97.
- [3] Payne, A., Brinkman, W.-P., and Patel, N. An e-learning environment to engage students in ethical thinking. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 5-15.
- [4] Payne, A.M., Brinkman, W.-P., and Wilson, F.C. Towards effective feedback in e-learning packages: the design of a package to support literature searching, referencing and avoiding plagiarism. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 69-83.
- [5] Read, J.C., Mazzone, E., Qualter, P., Horton, M., Zioui, L., and Gator, C. The Cool project: learners designing their own e-learning. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 25-35.
- [6] Rizvi, Z. E-learning tools in BT. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 99-105.
- [7] Smith, H., and Underwood, J. E-science, e-learning but not as we know it. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 53-67.
- [8] Stephenson, J.E., Rayne, R.C., and Griffin, D.K. Online assessment and feedback to facilitate higher order learning skills in classical and molecular genetics. In *Proc. of HCI 2007 workshop: Design, use and experience of e-learning systems*. Payne, St Albans, UK: 2007, 37-51.

<sup>2</sup> <http://hci4tel2008.blogspot.com>