

# Utilising Best Practice in ICT Design for All Teaching

Middlesex University, Trent Park Campus, Bramley Road, London, N14 4YZ  
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## *Contents*

<b>Gill Whitney, Suzette Keith</b>	<b>2</b>
<i>Workshop Report: Utilising best practice in ICT Design for All Teaching</i>	2
<i>Discussion Sessions Summary</i>	2
<b>Joy Goodman-Deane, Sam Waller, John Clarkson, Pat Langdon</b>	<b>4</b>
<i>An Online Toolkit for Use in Design for All Education</i>	4
<b>Gill Whitney</b>	<b>5</b>
<i>Step One – Introducing the Idea of Design for All</i>	5
<b>Colette Nicolle</b>	<b>6</b>
<i>Coursework for All: Assessment for Independent Living</i>	6
<b>Yehya Mohamad, Carlos Velasco, Stefan Carmien</b>	<b>8</b>
<i>Building Advanced Internet Services and Applications using Web Standards: Accessible Interfaces and New Devices</i>	8
<b>David Sloan</b>	<b>11</b>
<i>Inclusive Design at the University of Dundee</i>	11
<b>Christian Petter, Kathrin Helling</b>	<b>12</b>
<i>ICT Training Course for Trainers – Meeting Senior Learner Needs</i>	12
<b>Elizabeth Stokes</b>	<b>13</b>
<i>An Autistic Design-for-One Multimedia Centred Learning Intervention Approach</i>	13
<b>Suzette Keith</b>	<b>14</b>
<i>Teaching practices and strategies around the EU</i>	14
<b>Chris Sadler</b>	<b>15</b>
<i>Where is the Level Playing Field</i>	15
<b>Alan Newell, Joy Goodman Deane, Maggie Morgan</b>	<b>16</b>
<i>Relative Confusion</i>	16

**Gill Whitney, Suzette Keith**

*Workshop Report: Utilising best practice in ICT Design for All Teaching*

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In a celebration of best practice in Design for All in ICT training delegates from around Europe attended a workshop held at the Trent Park Campus, Middlesex University. The speakers revealed how they have engaged their students with the issues of designing interactive technologies to meet the needs of a diverse community. These included the development of a design toolkit, a practical project working with children with special needs, an e-learning project with older adults and a video of older people buying and using digital tv.



Picture: Welcome to Middlesex University - Dick Comley, Gill Whitney and Suzette Keith declare the workshop open

Delegates explored how to bridge the knowledge gap between the student and successful Design for All practitioners. The presentations and the discussion sessions addressed issues such as the need to equip students with both theoretical and practical skills, the development of inter-personal skills to enable students to work with older and disabled people, the use of personas as a training tool and the use of learning outcomes to define how Design for All can be incorporated into ICT courses.

The workshop was organised by Gill Whitney and Suzette Keith with the assistance of Irena Kolar and Judy Wilson in her role as teaching and learning co-ordinator. The event was arranged as a part of the activities of the Design for All@eInclusion project, the European Design for All eAccessibility Network (EDeAN) and supported by funding from the Teaching and Learning project, Middlesex University. It was attended by nearly 50 delegates including members of the DfA@eInclusion and EDeAN project, members of other European projects: Accessible e-Learning Platform for Europe eTen (ALPE), NETIS and ICT Training for trainers (ICT4T), other UK teachers, trainers and researchers working on eInclusion as well as an interdisciplinary mix of staff and students from Middlesex University. Two group discussion sessions ensured that everyone had a chance to share and learn from the experiences of others.

#### *Discussion Sessions Summary*

There were two group discussion sessions lead by Judy Wilson, School of Computing Science, Teaching and Learning Co-ordinator, Middlesex University

#### **Discussion 1: Student needs analysis: who and how?**

The discussion session involved all the workshop attendees working in small groups to use the technique of persona development to identify and create a suitable persona for a prospective ICT student. This was used to help envisage their personal learning needs to enable them to progress their career and to utilise Design for All ideas and methodology. This session went well and enabled

the participants to consider the learning gaps with respect to Design for All for students on a range of different ICT courses at different levels across the EU. The personas created in this session included a mature student who was undertaking a full MBA in Design for All (who needed information on the technical aspects as well as the business case), an International PhD student focusing on accessible tourism (who is motivated towards Design for All but has little previous experience) and a First year undergraduate programming student (who is very keen on technology and initially has little idea why he needs to know about older and disabled people).



Pictures: Delegates describe their student persona

### **Discussion 2: Developing knowledge and skills - what should the student know about design for all in ICT?**

The groups from the morning session re-formed and discussed the requirements for Design for All knowledge and skills that 'their' student had. Each group identified four learning outcomes which could then be developed into real teaching material.

For example, one group proposed a module title: Opportunity from Diversity, and the learning outcomes:

At the end of this course you will be able to:

- Understand the breadth of human diversity.
- Articulate and promote the business, ethical and legal cases for inclusivity.
- Critically evaluate the impact of diversity on managing business activity.

**Joy Goodman-Deane, Sam Waller, John Clarkson, Pat Langdon**

*An Online Toolkit for Use in Design for All Education*

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Design for All and Inclusive Design are important approaches that help designers to address the challenges and opportunities posed by the ageing population and the social and political demands for equal access by people with disabilities [1]. However, it can be difficult to incorporate them effectively into design courses, in a way that makes a real impact on the students.

In our work, we have found some ways to increase this effectiveness. In particular, we have found that design students respond well to projects where the context and relevance are clearly defined. This is particularly important in inclusive design, where students sometimes struggle to relate to the needs of people who are different from themselves. In addition, design education is greatly enhanced by the use of practical resources, that help students to apply inclusive design principles in design projects.

Together with BT, we have therefore produced an online inclusive design toolkit that builds on these aspects (<http://www.inclusivedesigntoolkit.com/>). Its first sections clearly define and motivate inclusive design, providing illustrative case studies to indicate that inclusive design not only includes more people, but also generates better overall designs. Later sections provide a description of an inclusive design process, which students can use to structure their projects. This starts with discovering an understanding of the real user and business needs, and works through to the specification of requirements and development of concepts.

As a design student who used the toolkit explained, “we were able to incorporate a wide range of tools and information into design process, particularly as the toolkit helped structure our work and so allowed this to progress more quickly”.

Continues.....

For full abstract see Goodman-Deane.pdf or use the link above to view the inclusive design toolkit

**Gill Whitney**

*Step One – Introducing the Idea of Design for All*

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CCM1418, Introduction to Operating Systems, Architectures & Networks is a first year module which is taught to approximately one hundred first year computing science across seventeen different degree programmes at Middlesex University. The concept of Design for All is introduced to the students within the hardware element when computer input and output devices are being considered. Once the idea that to function properly a computer needs to get information in to process and also to be able to display that information in a suitable way has been accepted, it is a small step to considering how information can be both collected from and presented to a wide range of people. This discussion is facilitated by the use of a number of pieces of access technology and by the use of a number of clips from you tube including the following:

One Thumb to Rule Them All <http://uk.youtube.com/watch?v=2BhHwk9qSvI>

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*Coursework for All: Assessment for Independent Living*

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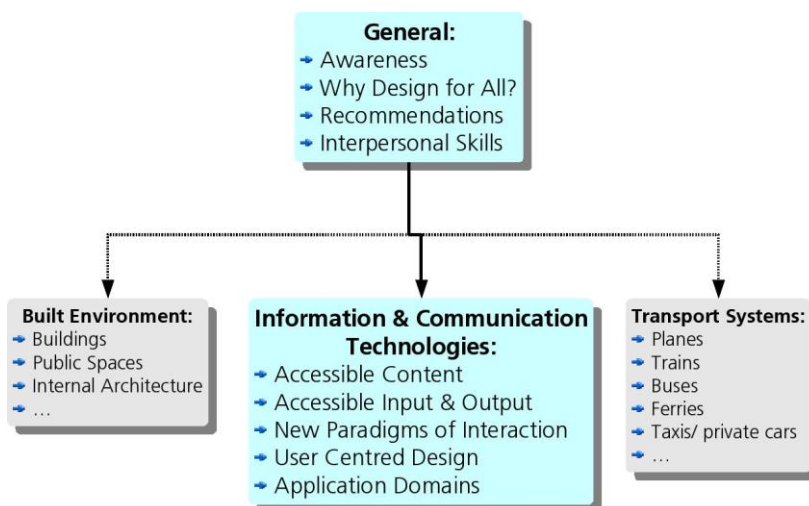
### Background and Coursework Brief

The Department of Human Sciences at Loughborough University offers a “Disability, Ageing and Inclusive Design” module, of which I am the module organiser and internal examiner. This module is offered as an option to both finalists and post-graduate students, but it is compulsory for those studying for the MSc in Human Factors and Inclusive Design. In addition to a final examination (worth 50% of the final mark), all students must complete one piece of coursework, a critical assessment of the accessibility, usability and acceptability of some aspect of everyday, independent living (eg, transport, banking, shopping etc) for older and disabled people. The aim of this coursework is to:

- Integrate the knowledge covered earlier in the module,
- Emphasise requirements capture and evaluation techniques with older and disabled people, and
- Rehearse more effective interpersonal skills for teamwork and communication in the context of Design for All.

As part of their mark, the post-grads must also deliver a 10-minute presentation to the rest of the class, and as this module is co-taught with the undergrads, there is usually a healthy audience.

This coursework reinforces general topic areas from the IDCnet project’s taxonomy of knowledge and skills (Figure 1) that could or should be taught under the umbrella of design for all (Velasco, 2004; Nicolle et al, 2005). These topic areas, applicable to all application areas, include Awareness, Why Design for all, Recommendations and Interpersonal Skills. The latter is reinforced not only through communicating with an older or disabled person whilst identifying the user’s requirements, but also in communicating the results of the research to the other students in the class.



**Figure 1. IDCnet’s Taxonomy of Design for All Core Knowledge and Skill Sets**

Extracts from the brief given to the students are given below:

Choose and describe a specific service. This could be, for example, public transport, banking, the post office, leisure facilities, supermarkets, libraries, etc.

You should critically assess the accessibility, usability and acceptability of this service by older and disabled people, and whether it enables them to maintain an independent lifestyle. You would want to consider the different ways in which a person might obtain the service (even more important for older and disabled persons). It should NOT be a detailed web accessibility or built environment audit, although it may contain some elements of these dimensions.

. . . If you involve a real user in your study (and you are encouraged to do so), it must be someone you already know, e.g., an elderly relative, or a friend or relative who has a hearing or visual impairment. (If the participant is well known to the student, the ethical protocol is not quite so stringent, i.e. a chaperone is not required when conducting interviews and observation in the home of the participant). Please make it clear in your coursework whether or not a real user has been included—give a description of their difficulties or impairment, but do not provide names or photos showing their faces. Each student, before undertaking the evaluation, must let Colette know if you are involving a real user. In this way, you can confirm knowledge of the protocol requirements (e.g. an informed consent signed by the participant).

As part of the coursework, you will also be expected to carry out a literature review covering key aspects of your study. . . .

Your report should:

- Describe the service and any alternative ways of obtaining the service
- Include an assessment of how the abilities or needs of older or disabled people may affect the accessibility and usability of the service
- Include a critical analysis of the extent to which the service meets these requirements
- Present your conclusions and recommendations.

Students are reminded that if they are not able to involve a real user, they can develop a persona (a hypothetical archetype, representing a real person) in order to carry out their assessment (Dong et al, 2007). With either a persona or real user, it is emphasised that for a good mark, students need to extrapolate their findings from one user to a range of other users. For example, if a person with visual impairment is having difficulty with a self-service checkout at the supermarket, then other users (an older person, a person with cognitive impairment, or a novice user) are also likely to have difficulties. It is also important to recognise the multi-faceted aspects of inclusive design, with ICT forming only part of the bigger picture.

### **Example**

*Not for publication*

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**Yehya Mohamad, Carlos Velasco, Stefan Carmien**

*Building Advanced Internet Services and Applications using Web Standards: Accessible Interfaces and New Devices*

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We will present in this document our experiences and views on Design for All Curriculum, based on several years of ongoing teaching at Masters level and workshops. Two of these workshops were part of the IDCnet<sup>1</sup> project, a Thematic Network funded under the IST Thematic Priority of the 5th Framework Programme from the European Commission. Another workshop was organized within the activities of the DfA@eInclusion,<sup>2</sup> a Coordination Action that aims to contribute towards the advancement of eInclusion in Europe through fostering design for all. It is funded under the IST Thematic Priority of the 6th Framework Programme from the European Commission. The activities of IDCnet and DfA@eInclusion are aimed at supporting the European Design for All e-Accessibility Network (EDeAN).

The strategic goals of the workshops were to integrate information and identify core knowledge sets and skills in design for all for model curricula at universities and training modules for employees at industry.

### **Why teaching design for all in ICT?**

Having rapid access to relevant information has become an essential factor for successful participation in economic, cultural and social processes. Nowadays, society and organizations are dependent on complex information systems and electronic publishing. New usage scenarios of information and communication technology (ICT) are spreading and their impact is obvious in many aspects of our daily lives –at home, at work and in contact with public authorities, in shops and banks, in schools and universities. This makes access to information of all kinds vital for all citizens independent of their abilities, context of usage and the used devices to access the information. Such universal access to information can only be ensured by designing such systems in a Design for All fashion. This requires subsequently students to be taught in the principles and guidelines of DfA in order to be able later on as engineers and designers to construct systems that fulfil those guidelines and obey such principles.

### **Industry requirements on curriculum for Design for All in ICT**

It is a known fact that a high percentage of European universities' curricula do not reflect the DfA needs of industry. Therefore, we focus our discussion in a context that could identify first those needs, and then introduce recommendations dealing with Universal Access [**Error! Reference source not found.Error! Reference source not found.**].

There are several technological landscapes in the area of ICT that can be affected by the incorporation of DfA:

- Accessibility guidelines and APIs
- Device independence
- User and device profiling
- Semantic Web and metadata
- Multi-modality
- Web 2.0 – AJAX
- Distributed Computing – Web Services technology
- Compliance

A number of big industry players are already working on DfA or accessibility, but they face a number of barriers. Software engineers are usually not taught about accessibility at the university, so they need to be retrained. For Web developers, the situation is even worse, because they have often no formal training.

<sup>1</sup>

<http://idcnet.info/>

<sup>2</sup>

<http://www.dfaei.org/>

The drive for DfA is usually top-down, not driven by the knowledge or training of the developer. Accessible products are developed by companies where senior management understands the value of accessibility. Similarly, large accessibility initiatives in the Open Source community are usually supported by big industry players (IBM, Sun).

Many companies have misconceptions about DfA, and think that it is only design for the elderly and disabled, or that it means 'one size fits all'. Many also consider anything that costs more than the able-bodied version as an 'undue burden'. Existing guidelines, for example the Web Content Accessibility Guidelines, are sometimes seen as too complex and too detailed. There have been surveys on what would be good incentives to incorporate accessibility: profits or increase in Web site traffic always come out on top, while legislation and policy are the least popular incentives.

Industry also wants closer ties with organisations that perform research on DfA, easier access to research results and exemplars of good design as sources of inspiration. They also would like more support from the outside. Companies who start out in this area want to know how to implement DfA in their organisation. There are few sources on the ideal graduate profile for designers and engineers with regard to DfA, so it is necessary to extrapolate from recommendations from related fields (HCI and ergonomics). Some examples gathered from the HCI area state that:

- There is a greater need for HCI experts than for methods and tools.
- The industry prefers pragmatic knowledge and hands-on advice on guidelines to perfectionism.
- People should be trained to become sensitive to good and bad design.
- Learning on the job and using your skills and expertise in projects is one of the best ways of learning.
- Inviting guest lecturers from companies can increase credibility.
- There is a need for HCI education for people who end up in supervisory or decision making positions. There might be a greater need for soft skills than knowledge.

### **Taxonomy of Knowledge and Skills in DfA**

In order to work towards curricula recommendations, it is also necessary to understand what constitutes the knowledge [3, 4] and skill sets that form the body of knowledge about DfA. Defining and understanding this body of knowledge or 'discipline area' forms a basic task of most curriculum studies [1]. It may be argued that DfA is more of a philosophy than a discipline in its own right. This argument is taken up and refuted in [2,3, 4], and a taxonomy of knowledge and skill sets that can be said to be distinct to DfA has been proposed:

- Design for All Awareness
- Why Design for All? Ethical, legal and commercial considerations
- Guidelines and Recommendations
- Accessible interaction: input and output
- New paradigms of interaction
- User-centred design

### **Course Assessment**

- Set of mini-projects (presented along the initial classes)
- Groups of 2-3 students per project
- Results presented as a project (end of semester)
- Development in Java combined with Open Source libraries
- Queries via mailing list
- Final marks based upon the projects

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**David Sloan**

*Inclusive Design at the University of Dundee*

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The School of Computing at the University of Dundee has a long tradition of teaching and research in inclusive design. From a research perspective, we have a large and active body of researchers investigating how technology can be used to improve access to information and communication for people with sensory, physical and cognitive impairments, with a particular focus on older people, non-speaking people and people with dementia. Examples of recent and ongoing work include approaches to ICT design with and for older people [1], the use of theatre to promote inclusive design thinking [2], and rethinking approaches to accessible web and e-learning design [3].

This work parallels our approach to teaching computing science at undergraduate and taught postgraduate level, which integrates principles of inclusive design throughout the curriculum [4]. Most notably we give students as much opportunity as possible to experience first-hand the diversity of end users, through group and individual projects that involve working with, and producing technology for, people with specific access needs; while, given the nature of the research interests of staff, many Honours projects have a strong accessibility focus. Our approach to teaching inclusive design is strongly influenced by our research activity and theory that emerges from research. So, for example, we are increasingly conscious of the need to use the students' time working with and for people with diverse capabilities to raise their appreciation of the diversity *within* these supposedly homogenous groups (in particular those who might be grouped under the umbrella of 'older people'). Feedback from graduates indicates that employers greatly value the enhanced awareness of the diversity of end users and the technological adaptations required to promote inclusivity that the degree brings.

Beyond teaching and research, the School of Computing promotes inclusive ICT design in industry, education, and the public sector through a number of activities, including the work of the Digital Media Access Group (DMAG). DMAG provides a commercial consultancy service focusing on web and ICT accessibility, and also runs the University of Dundee's Web Accessibility Support Service. Again, the experiences of promoting designing for accessibility and inclusion amongst people with diverse technological expertise and from diverse backgrounds feeds back into our own investigations into how accessibility can be most effectively taught.

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**Christian Petter, Kathrin Helling**

*ICT Training Course for Trainers – Meeting Senior Learner Needs*

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### **Abstract**

The structure of societies is changing due to unprecedented demographic changes. Pervasive and enduring consequences of the ageing population present enormous opportunities as well as enormous challenges for European societies. Initiatives for lifelong learning have yet not sufficiently taken into account the specific needs of senior citizens. Although technologies are recognised as relevant platforms for information and communication as well as important instruments for teaching and learning, the design of courses and information- and communication technologies (ICT)-enhanced training of elder persons in this field still remains a challenging task which has not yet met the goals in terms of the identification and application of effective methods which could support learning.

The ICT4T project, funded by the Socrates program of the EU, therefore aims to better respond to senior citizens needs in terms of use of ICT and eLearning by addressing the needs of trainers and training organisations in Europe to design specific programs for ICT-supported training of senior citizens and develop their eLearning design competence according to Design-for-All principles.

The project's outcomes should motivate training organisations and/or the professional community working in the field of training for older adults to apply the presented approaches and to utilise ICT in senior education. Senior self-help groups active in education should also profit from the results.

The main outcome of the ICT4T project is a train-the-trainer course focusing on teaching and learning with ICT according to the needs of the elderly. This course is developed based on a "Needs and requirements analysis" – a collection of material relating to the needs of elderly in terms of teaching and learning and requirements for course design both at a European and national/local level – and a "State-of-the-Art"-overview. The course consists of the following eight modules and is delivered both face-to-face and online:

Module 1: Introduction and Experiences

Module 2: Senior Learner Needs in the Context of ICT-Based Teaching

Module 3: Accessibility Issues in the Context of ICT-Based Teaching of Seniors

Module 4: Learning Theory in Senior Learning with ICT

Module 5: ICT Tools Available for Use in Senior Learning

Module 6: Pedagogical Issues – Activities Using ICT with Senior Learners

Module 7: Pedagogical Issues – Teacher Roles in Use of ICT with Senior Learners

Module 8: Pedagogical Issues – Course Design Project

By the time of the EDeAN workshop all training courses – both ftf and online – will have been completed, and we will be able to present evaluation results from the courses. The course evaluation will focus on the general usability of the Moodle course environment and the training materials as well as on their accessibility. Results will also particularly focus on the specific requirements of senior citizens with regards to ICT-based learning.

**Elizabeth Stokes**

*An Autistic Design-for-One Multimedia Centred Learning Intervention Approach*

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**Abstract**

Children on the autistic spectrum, differ in their spectrum of needs, with a variance in their strengths, weaknesses, likes, dislikes and interests. However, generic commercialised software does not seem to take into consideration each pupil's spectrum of needs. This paper explains how ongoing cohorts of university students and teams of computing science academics in Dubai, Hong Kong and England, as part of an assignment, use real case studies, with an ongoing collaborative Autistic Design-For-One Multimedia Centred Learning Intervention approach, for developing personalised educational multimedia games for children on the autistic spectrum. This approach enables teaching staff, speech and language therapists and parents to complete case studies of autistic end-users. Students use these details of each pupil's spectrum of needs as a holistic baseline, to carry out in-depth research. They use imaging, digital audio, MIDI and authoring software, resulting in the appropriate development of personalised educational multimedia games. These are evaluated by the students, academics, the users (the professionals and parents) and end-users (children on the autistic spectrum). The results of which are fed back to further cohorts of students, in order to develop further software for each individual.

**Suzette Keith**

*Teaching practices and strategies around the EU*

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Design for All @ eInclusion is a EU Framework 6 Collaborative Action which is supported by the work of the National Contact Centres of 22 European Countries. Key objectives of this project are to provide an information resource, develop education and training, engage with industry and promote knowledge and practice. The Design for All Research Group, School of Computing Science, Middlesex University is the UK National Contact Centre and leads the workpackage in education and training. We are working towards the development of practical syllabus guidelines to support teaching at Masters and vocational levels.

Our first survey with our 22 EU partner countries revealed some encouraging examples of DFAICT teaching embedded within computing science, product design, electrical engineering, information sciences and assistive technologies. In many cases these instances are examples of ‘hidden gems’ a term we have used to describe teaching about design for all issues that is largely invisible to outsiders and embedded within mainstream modules.

In all we found examples of 50 courses containing some design for all content offered by 35 course providers in 18 countries. There was strong agreement from these courses that they covered the topics defined in a previous IDCnet project, including both the general issues of design for all awareness, legislation and guidelines and the ICT specific issues such as accessible content, accessible interaction, user centred design process and new technologies.

There was however a lack of explicitly named full time courses such as inclusive design or eInclusion. Much of what we found were small optional courses with a credit value of less than 6 ECTS (this is equivalent to less than 10% of a full year of education)

We have examined the teaching provided in more detail with 16 course providers from 11 countries. While there is strong agreement on content, differences in national practice have made it difficult at times to compare what the students learn from these courses, however there are examples of good practice and a strong emphasis on practical individual and team based projects.

In order to shape an international teaching syllabus we are looking to some European initiatives which are working to promote harmonisation of education practices by 2010 – especially the Bologna Process and the European Qualifications Framework (EQF). Under the Bologna Process higher education structures are viewed as 3 cycles: bachelor, masters and doctoral which is already a familiar structure in the UK but not elsewhere in Europe. Under the EQF there is a strong emphasis on student centred learning and learning outcomes as a strategy to promote comparability and transferability. This again is a less familiar concept outside of the UK. We are applying the student centred learning approach so that we can develop agreed learning outcomes and assessment strategies as part of the package of practical guidelines for syllabus development and delivery.

(Note: The discussion session that followed invited the delegates to apply a student centred learning approach and to develop learning outcomes, assessment strategies and teaching methods)

**Chris Sadler**

*Where is the Level Playing Field*

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Social software is the latest manifestation of the Internet Age. People use the likes of Facebook and Hi5 to keep in touch with old friends and (significantly) to make new friends. Because these contacts are *disembodied*, many of the physical and social (and some cultural) factors that can separate people are absent and so individuals can 'be themselves' in different ways and so find common ground with unlikely companions.

My session will describe a teaching trial arising out of the Leonardo NETIS (Network for Teaching Information Society) project which used social software to connect supposedly like-minded classmates to work together on a common assignment. The class was required to construct a network where members were connected through the social software they had in common. Each student then sought a partner with whom they were most closely linked, and the pair then worked together on a joint learning assignment. Prior to commencing the trial, students were required to complete a questionnaire designed to determine their preferences for *connected* (i.e. collaborative) or *separate* (individualistic) learning.

Whilst the study is primarily designed to explore the proposition that highly connected pairs will collaborate better than highly separate or mixed pairs, a number of interesting subsidiary questions pose themselves, including

1. Does the use of multiple social software packages correlate with a connected learning preference?
2. Can pairing by means of social software predict effective partnerships?

The results could indicate that collaborative learning tasks set in a virtual social environment can provide a substantive educational inclusion mechanism – in effect making the Internet something of a level playing field.

**Alan Newell, Joy Goodman Deane, Maggie Morgan**

*Relative Confusion*

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## **Background**

Theatrical techniques have the power to capture people's attention, change attitudes and convey information in an engaging and powerful manner, and can therefore provide a very useful educational resource. In particular, the School of Computing at Dundee University has been examining the use of professional theatre, in the form of both live theatre and video, within HCI research for a number of years [1,5]. This format has been used to raise awareness of Design for All issues with both IT students and designers of new technology, through facilitating discussion on the challenges faced by older people [8].

The first video production created as part of this work was the UTOPIA Trilogy [11], which stemmed from research on the UTOPIA project (Usable Technology for Older People: Inclusive and Appropriate) [3]. This consisted of three vignettes, which examined older people's experiences with different kinds of ICT equipment. These were:

1) "Peter and Jane buy a webcam", 2) "Experience with Email", and 3) "Sandy's mobile adventure".

Formal evaluation of the UTOPIA Trilogy with both students and professional designers showed that it significantly changed the attitudes of the audience to the characteristics of older people, and to the challenges presented to them by new technologies [2].

The School of Computing has also used live theatre as part of Requirements Gathering exercises for novel technologies designed for older people [4,7,10] and for awareness raising at international conferences [6,9].

*Relative Confusion*

Following on from this work, the video "Relative Confusion" was designed particularly for use in educational environments. It examines the following scenario:

When Jack and Tommy decided to surprise their sister Maureen with a digital TV system, the one thing they didn't reckon with was the minefield of bewildering new technology they were about to enter. One thing it won't be is... 'A PIECE OF CAKE'..

This video shows a range of challenges provided by new technology to naïve users, especially older ones, and illustrates the results of long-term research into these challenges. It is best viewed as an entity, presenting a complete storyline and giving context to the range of issues faced by older users. However, after showing the video, educators can jump to specific parts of the DVD to initiate discussion on particular issues or to convey specific messages concerning the technological challenges faced particularly by older people.

A wide range of discussion points are illustrated in the video, and can provide starters for further discussion and exploration of the issues with students. These include:

- Users' ability to learn and their memory for new control methods
- The effects of poor eyesight and manual dexterity
- The interaction of poor eyesight and memory
- The primacy of learned conventions
- Modal errors and the effect of cognitive load
- Loss of control due to complex interaction techniques
- The consequences of jargon
- Knowledge of other requirements and functionality
- The ease (or otherwise) of installation
- The usability of manuals
- Complex interaction methods
- Interface design, labelling and colour coding
- Backwards compatibility

- The rate of learning new functionality
- Standardisation of interaction metaphors and methods
- Interface design, undo methods and operational anxiety
- Intergenerational differences

This video has been used with a range of university students, from whom it has received positive evaluations, and an indication of changed attitudes.

### **The presentation**

The workshop session will involve a showing of the video, “Relative Confusion”, followed by a discussion on the value and use of professional theatre within computing education and training.

### **Obtaining Relative Confusion**

“Relative Confusion” can be obtained from:

Prof. Alan Newell, School of Computing, University of Dundee, DD1 4HN

(afn@computing.dundee.ac.uk), for a charge of £10 to cover costs of copying and postage.

### **References**

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11. UTOPIA Trilogy: A CD ROM. Online at:  
<http://www.computing.dundee.ac.uk/projects/UTOPIA/utopiavideo.asp>

### **Further Information**

Further data about the physical, sensory and cognitive effects of ageing can be found in A. Carmichael (1999). *Style guide for the design of interactive television services for elderly viewers*. Kings Worthy Court, Winchester.

<http://www.computing.dundee.ac.uk/projects/utopia/publications/>

Other information on designing for older users is available on Dundee University’s web site - <http://www.computing.dundee.ac.uk>, and the UTOPIA (Usable Technology for Older People: Inclusive and Appropriate) web site: <http://www.computing.dundee.ac.uk/projects/UTOPIA/>

For further information on Best Practice in ICT Design for All Education and Training see [www.edean.org](http://www.edean.org)

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