

**Embedding Universal Design
in the Curriculum**

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Abstract

This paper contributes to the growing research on incorporating universal design in academic programmes. The universal design philosophy and motivations are introduced. This paper describes an approach to implement this, based on the experience of including universal design as a module in a first year programme in the Institute of Technology, Blanchardstown. The need to ‘make real’ and ‘make connections’ with universal design thinking within the module was considered highly important. The approach chosen was to have input from universal design experts discussing and presenting the key issues. This generated the opportunity to capture these valuable contributions, resulting in a repository of universal design resources. An outline of selected student assessment projects is presented where student creativity and discovery abound. The development of the awareness of universal design thinking is extremely important, at individual student level, and the associated ripple effect on awareness and design.

Keywords

Universal Design, User Centered Design, Inclusive Design, Curriculum

1. Universal Design Introduction and Motivations

Universal Design is an approach to the design of all products, services and environments to be as usable as possible by as many people as possible regardless of age, ability, or situation. (Mace, 1985).

“UD is an approach to design that honors human diversity, addressing the right for everyone--from childhood into the oldest years--to use space, products, and information in an independent, inclusive, and equal way. Universal Design invites designers to go beyond meeting minimal access or building code compliance to create excellent, people-centered design”. (Ostroff, 2001)

Universal Design acts as *‘social emancipation to help people change conditions and build better worlds for themselves, thus making through design, the so called weak-component in society as strong as every other part’.* (D’Souza, 2004).

Universal Design is about good design from which all people will benefit. World demographics are changing, with increasing life expectancies, improved survival after illnesses and injury. There is a need to reflect more accurately the diverse demands of today’s consumers – which includes older people and people with disabilities.

(Frayling, 2003)

2. Background to the Project

Within the education sector our college has much expertise in inclusive education projects, both as specialist projects and mainstreaming projects, through recent SIF initiatives. We are improving our response to diversity at third level education. We are increasingly aware of how the student population is different in terms of mobility, visual ability, hearing ability, left or right handed, speech ability, learning styles, diversity in language, background and custom etc.

Our current aim is to take the focus of inclusive design out of the specialist and into the mainstream, (Helen Hamlyn Design Awards, 2011), by teaching universal design as a mandatory module to first year students.

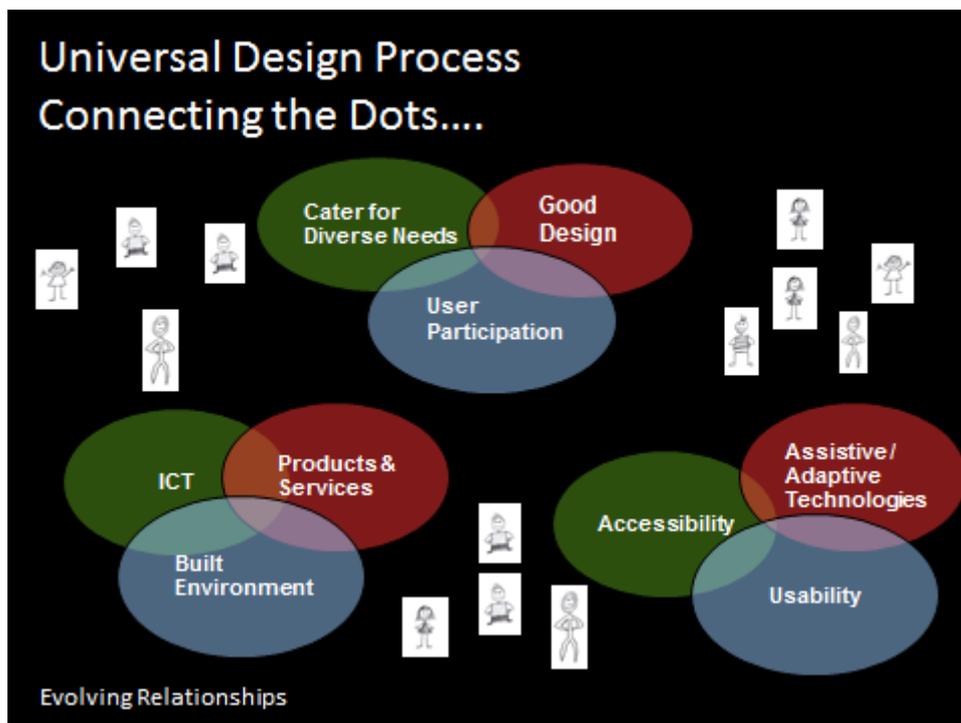


Fig. 1: Making the Universal Design Connections

3. Seven Principles of Universal Design

The seven principles of Universal Design are as follows:

Principle	Meaning
1: Equitable Use	The design is useful and marketable to people with diverse abilities.
2: Flexibility in Use	The design accommodates a wide range of individual preferences and abilities.
3: Simple and Intuitive Use	Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
4: Perceptible Information	The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
5: Tolerance for Error	The design minimizes hazards and the adverse consequences of accidental or unintended actions.
6: Low Physical Effort	The design can be used efficiently and comfortably and with a minimum of fatigue.
7: Size and Space for Approach and Use	Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Fig. 2: Copyright © 1997 North Carolina State University, The Center for Universal Design.

4. Embedding Universal Design in the Curriculum

We devised a syllabus to teach universal design to first year students. The main aim in the delivery of the Universal Design module is to make the subject matter ‘real’, to illustrate the effect of universal design on real lives, both positively and negatively and thus allow the students the opportunity to fully appreciate the value of good design, on a human level. We accessed and captured the universal design experts as guest speakers, at seminars, conferences, and workshops and on external visits.

This project is developing a library of video learning resources to provide learners with knowledge of the important conceptual, theoretical, social, technical and design issues associated with universal design. The library of video recordings (Fig. 3) to date are as follows:

Event Description/Notes	Duration (hours)
Introduction to Universal Design and Seven Principles Workshop Guest lecturers facilitate The Principles of Universal Design workshop. A tag-team approach was used, with drawing illustrations capturing the design challenges.	3
Irish Guide Dogs Guide dog workshop on guide dogs and assistance dogs. Students get to meet and experience the puppies in training. Student fundraising project to increase disability awareness with photo shoot and video capture of puppies at play on campus. The students then look at the implications of design from the dog’s viewpoint and the impact of injury to the dog and the restrictions imposed on its owner if the dog is injured.	2
Universal Design on the Urban Scale for the Aging Population Focus on buildings and environments for the aging population, both nationally and internationally.	3

<p>Introduction to Visual Impairment and the Technologies that Enable</p> <p>This workshop focuses on how we can enable or disable by our designs..</p> <p>Everyday tasks were demonstrated on-line using JAWS screen reader: shopping, booking holidays and flights, followed by workplace technologies and communication devices.</p> <p>Braille system demonstrated, followed by a practical reading and writing Braille session..</p>	2
<p>Web Accessibility</p> <p>The Centre for Inclusive Technology (CFIT) at the National Council for the Blind of Ireland (NCBI) provided sessions on Web accessibility demonstrating how with good design more people can perceive, understand, navigate, and interact with the Web,</p>	5
<p>External Visits: Assistive and Adaptive Technologies</p> <p>Introduction to the world of assistive and adaptive technologies with external trips to Enable Ireland. Through lectures, demonstrations and hands-on practicals, students were led through the range of alternative devices and smart home technologies. Students had the experience of using eye gaze software, with webcams calibrating eye movements and later with eye movements sending emails, select songs on iTunes, creating documents and reading the news.</p>	5
<p>International Conference on Universal Design</p> <p>Center for Excellence in Universal Design (CEUD)</p> <p>International speakers across a wide variety of themes - Includes three parallel workshops.</p>	12
<p>24 Hour Universal Design Competition 2011</p> <p>Competition brief, advisors, mentors, teams, idea generation, process, final products designs, presentations, judges' choice and people's choice.</p>	3
<p>Universal Design Flash Conference 2011</p> <p>Cambridge University projects, Phd research projects, Transition level projects in secondary school, Third level on-line multidisciplinary universal design module.</p>	3
<p>Universal Design User Views</p> <p>Views on Universal Design, understandings and examples.</p>	1

Fig. 3: Library of Video Recordings

5. Student Assessment

Assignments signify individual and team endeavours to create artifacts, digital or paper based, that capture the history, motivations, principles, diversity spectrum and user experience case studies. A sample of student work, as demonstrated to President McAleese, included in Fig. 4 below.

Assessment Deliverable	Details
Animation Illustrating daily living impacts of design for an adult with arthritis.	Structured interview, informal discussions, observations, audio and video recording informed this animation. The adult's voice is included as voice over to the piece. We are led through a world where heading to the ATM machine to withdraw money is taxing and proceeds to depict the difficulty in supermarket shopping.
Board Game Based loosely on the snakes and ladders concept	The game player profile is selected at the beginning. The products or services are randomly selected from a pack of cards. The game player may proceed, when a product or service is well designed, or retreats when design is prohibitive for a particular profile.
Exhibit Stacking Cardboard Box Five feet tall	Each box layer represents one of the seven principles of universal design. The individual guidelines are illustrated with a variety of images and text.
Children's Guide to Universal Design Features: multi-sensory, tactile, Braille, audio, voiceovers, close captioning etc.	Introduces primary school children to the idea of universal design and the seven principles world, where animal characters are introduced to represent good design across the seven principles in the user-friendly design forest. Accompanying worksheets also available.

Fig. 4.: Student Assessment

The student work depicts the Universal Design story: what it is and what it isn't; how it is a design process –and not merely a checklist of guidelines. It is very encouraging to witness the students' creative expression of universal design philosophies.

6. Conclusions and Future Developments

By springtime the college will be involved in guiding 200 students in universal design thinking, making the connections, making sense of and understanding the huge implications of good design for people. Diversity and adversity issues are tackled. The concept of accessibility is expanded to apply to the design of products and services, and the way in which all people interact with them.

This design inclusion theme can be expanded throughout their course and hopefully, after college, the students can extend the universal design thinking in the workplace.

As part of that universal design thinking the college has now created a large repository of universal design video content and best practice resources. The voices of many universal design experts have been captured. This can be used as lecturer reference material or student training material. We are currently working on final editing and reviewing best methods of sharing this learning resource. It is envisaged that lecturers who use this resource can provide feedback and add to the resource.

The key challenge is to extend this module into other first year courses. The adaptation is not the demanding factor – the challenge however is to ‘make room’ for this arena, as this module has to compete with many other modules.

This is necessary if we want to take the focus from the specialist and into the mainstream. This is achieved by *“placing the emphasis on design firmly in the margins of design practice, that focus on the softer, destigmatising aspects of designs that promote social integration. A rethinking that opens up the possibility of addressing issues of aging and disability within the mainstream of design”*.

(Clarkson 2003)

The main priorities for further college work on embedding universal design are:

- Contribute to the development of an online multidisciplinary universal design module for first year college students. This collaborative CEUD initiative is currently being developed and college trials commence in the Spring.
- Narrate the universal design story through interactive digital storytelling.
- Extend the creative expression of how we reflect, express, visualize the issues involved in universal design, in order to invigorate the understanding and increase the awareness.
- Deliver workshops to college staff on universal design.

To conclude with a student comment contributed at the close of a facilitated workshop:

A student came up and thanked the guest speaker saying:

“ I feel I have learned something very significant here today’ ...

The workshop was illustrating the enabling power and positive impact of good design.

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