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Talking Books and Accessible Literature for Students – A Library Integrated Approach

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Is Universal Design in Education Any of My Business?

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Foreword

Universal Design is in many respects what education looks like when it is the best it can be, and by that I mean that any potential student can easily access the course of their choice and engage fully in all aspects of learning as well as all other facets of college life including social activities, work placements, internships and of course, graduation.

Above all, it's about students being confident that they are being given an opportunity to be the best they can be, whether they have a disability or not and knowing that they will not have to fight just to be on a level playing field with their peers.

In 2013, AHEAD celebrates its 25 year anniversary. When considering how best to mark this, we were reminded of the stories of the many thousands of students with disabilities which have passed through the Irish higher education system since our formation, for their story is our story.

In celebration, we have gathered together 25 stories from people with disabilities who graduated between 1988 and the present, one from every year of our existence and put them together with beautiful photo portraits in a publication entitled "Journey of Students with Disabilities from AHEAD's 25 Year History" – and what great stories they are. Stories from artists, playwrights, teachers, politicians & journalists, stories about mothers, fathers, siblings & friends, but most importantly, stories about people living their dream because of education and in spite of all the barriers laid in front of them. While there are still significant barriers at play, I would like to believe things are changing.

Why? Because what I see throughout the stories we've collected and in the students we encounter every week, is a real passion for learning and an appetite for success and this passion is driving the change. It's a passion for a campus where everyone is welcome, where blind students can become teachers, where deaf students can become scientists and students with physical disabilities can

become nurses without having to fight for things others take for granted – ultimately where all students have the opportunity to realize their dreams.

We can learn much from our past but we can also take inspiration from the present, from the work that people do every day in colleges across the world to try to make a difference to the lives of students with disabilities in their institutions. The "Is Universal Design Any of My Business?" conference was an attempt to bring together some of the best examples of these people from Ireland and beyond and this publication collects the information presented, acting as both a reference for those who were present and a flavour of what happened for those who were not.

We hope it inspires you in your own work to help further enact the principles of Universal Design across our higher education system.

Mary Quirke

Assistant Director

AHEAD

Download our 25 Graduate Stories Publication Here>>>

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Introduction

All those who presented at the conference "Is Universal Design in Education Any of My Business?" were asked if they would like to contribute a piece outlining the key concepts behind their presentations and all of those who submitted are contained within.

Rather than put restrictions on format or type of submission, we allowed free reign for the presenters to submit as they wished with only a very rough guide of 1000 words.

Keynote Presentation

Universal Design for Instruction: A Model for Teaching Diverse Learners

Joan M. McGuire, Ph.D. (University of Connecticut)

The changing environment of higher education is marked by a heterogeneous student population consisting of traditional age participants, second language learners, veterans, and students with disabilities, among others. Given this diversity, it is reasonable to expect that classes will reflect multiple learning styles and needs, creating challenges and opportunities for faculty to examine their teaching. Over the past decade, interest in inclusive instructional practices has generated enthusiasm for the notion of universal design (UD). UD in the field of architecture is a conceptual tool for planning environments, products, and spaces that anticipates diversity among users and incorporates features to proactively meet diverse user needs.

Universal Design for Instruction (UDI) extends that concept to pedagogy through proactively planning and delivering instruction and assessing learning in ways that are responsive to diversity among college classroom learners. To support faculty as they implement UDI, nine principles have been developed from the original seven UD principles (Center for Universal Design, 1997) and two additional principles reflecting the social and community aspects of learning (Scott, McGuire, & Foley, 2003). The Principles of Universal Design for Instruction© include:

- Principle 1: Equitable Use. Instruction is designed to be useful to and accessible by people with diverse abilities. Provide the same means of use for all students; identical whenever possible, equivalent when not.
- Principle 2: Flexibility in Use. Instruction is designed to accommodate a wide range of individual abilities. Provide choice in methods of use.
- Principle 3: Simple and Intuitive. Instruction is designed in a straightforward and predictable manner, regardless of the student's experience, knowledge, language skills, or current concentration level. Eliminate unnecessary complexity.
- Principle 4: Perceptible Information. Instruction is designed so that necessary information is communicated effectively to the student, regardless of ambient conditions or the student's sensory abilities.

- Principle 5: Tolerance for Error. Instruction anticipates variation in individual student learning pace and prerequisite skills.
- Principle 6: Low Physical Effort. Instruction is designed to minimize nonessential physical effort in order to allow maximum attention to learning.
- Principle 7: Size and Space for Approach and Use. Instruction is designed with consideration for appropriate size and space for approach, reach, manipulations, and use regardless of a student's body size, posture, mobility, and communication needs.

Principle 8: A Community of Learners. The instructional environment promotes interaction and communication among students and between students and faculty.

- Principle 9: Instructional Climate. Instruction is designed to be welcoming and inclusive. High expectations are espoused for all students.

Another tool that is helpful in implementing UDI is the instructional cycle, a model about the stages in teaching. The instructional cycle includes three components: planning instruction (deciding the content, methods, materials, pacing); delivering instruction (presenting information, providing feedback, monitoring, adjusting); and assessing learning (determining measures of intended learning outcomes, providing student feedback, tracking performance). Although these are not discrete components and they overlap such that one stage informs and affects activities in another, it is useful to delineate instructional examples of UDI principles in practice according to instructional cycle components. For example,

Planning

- Creating a comprehensive course syllabus including a welcoming statement and course policies; learning objectives; schedule of dates with topics, reading assignments, assessments; information about non-course specific assistance and resources (writing and math labs, peer tutoring)(Equitable use, Instructional climate, Simple and intuitive)
- Providing rubrics for grading and information on how to access models of papers exemplifying range and reasons for differing grades (Simple and intuitive, Perceptible information)

- Monitoring the amount of clicking and scrolling required on a course website (Low physical effort)
- Providing links to online sources for supplementary reading materials that recognize learning/reading differences (Flexibility, Tolerance for error)

Delivering

- Posting advance organizers, lecture outlines, key points online *prior to* class; using the pause procedure when posing questions to be answered in class; varying strategies during lectures (breaking into discussion groups, using the think-pair-share idea)(Equitable use, Simple and intuitive, Perceptible information, Tolerance for error)
- Using a variety of media (audio, text, video, images, social media)(Flexibility)
- Starting *each* class with a summary of the key points from the previous class and doing the same when shifting or transitioning to a new topic *during* class (Perceptible information)

Assessing Learning

- Offering a choice in assessment formats (report, wiki page, group project, PP presentation); using student's cultural interests as a starting point for measuring skills; providing a study guide or exercises and quizzes on a website for extra practice (Flexibility, Tolerance for error)
- Using mid-semester student feedback to rectify any major area of confusion in the course; designing online discussion and group work; using brief in-class exercises for extra points; structuring a long essay or paper into sections to provide incremental feedback (Community of learners, Tolerance for error)

The intuitive appeal of a concept such as UDI that recognizes diversity as the norm and promotes proactive planning to respond to this diversity should not trump the importance of asking the "so-what" questions. Do inclusive instructional strategies make a difference in learner outcomes? Are faculty supportive of reflective teaching based upon a framework that promotes inclusion? Are the attributes of successful college instructors synchronous with UDI principles? There is evidence that UDI has the potential to inform practice in results from implementation studies and qualitative studies examining effective

teaching practices (Duden Street, Koff, Fields, Kuehne, Handlin, Getty, & Parker, 2012; Madaus, Scott, & McGuire, 2002; Park, Robbins, & Stodden, 2012; Scott & Edwards, 2012). In reality, serious discourse about the validity of applications of UD in educational settings is essential to avoid the sage advice of the U.S. Department of Education: "Practitioners have seen interventions, introduced with great fanfare as being able to produce dramatic gains, come and go over the years, yielding little in the way of positive and lasting changes…" (2003, p. iii).

Plenary Sessions

Digital Inclusion and Students with Disabilities – Your Role in Exploiting the Opportunities and Avoiding the Dangers

Mark Magennis, Esther Murphy – NCBI Centre for Inclusive Technology (CFIT)

Michael Shevlin – Trinity College Dublin School of Education

This interactive workshop was joint venture between the NCBI Centre for Inclusive Technology (CFIT) and the School of Education in Trinity College Dublin. It looked at the use of digital technologies in third level education, exploring the various opportunities and threats to inclusion that arise for students with disabilities and inviting stakeholders to consider what roles they can play in exploiting the opportunities whilst reducing or eliminating the threats.

Background

Third level education, like so many other aspects of society, has experienced a massive growth in the use of digital technologies and content in recent years. On many university-level courses, teaching materials and learning resources are accessed mainly in digital formats, on PCs, mobile devices and e-Book readers via websites, Learning Management Systems, online library systems and the open internet. Administrative functions such as course application, registration, accommodation and ancillary services are also often mediated through websites, online forms and digital documents. Communications between lecturers and students and within the student body also typically use primarily digital systems and channels.

These applications of digital technologies have opened up possibilities for participation in education that were previously closed to many students with disabilities. For example, students with visual or hearing impairments often find that digital formats accessed using assistive technologies such as screen reading software are more accessible to them than the printed or spoken word. For students with physical impairments, access to digital communications and resources can reduce the need to travel and the problems of inaccessible buildings.

However, these same digital systems and content can also raise new barriers to access if they not designed and deployed with reference to the needs and capabilities of students with disabilities and if they are not designed to be interoperable with common assistive technologies.

There are a number of stakeholders involved in the design, implementation and use of technologies in education. These include the system designers, commissioners/procurers, developers, content creators, lecturers, administrators, policy makers, support staff and the students themselves. Each stakeholder has a role to play in ensuring that digital systems, content and devices are accessible.

Students' experiences

The workshop heard from two students with disabilities who shared their experiences, both positive and negative, of using digital technologies in education. Saleem Ur Rahman, a blind Computer Science student at Institute of Technology Blanchardstown, found many things difficult at first. He was unable to access vital information in printed books and PDFs that were inaccessible to his screen reading software. However, with assistance from the lecturers and the disability support service, the situation has improved and Saleem now faces fewer barriers. One example is that all the mathematical formulae have been converted to MathType, a format that is readable by his screen reading software. James Brosnan, who has Cerebral Palsy, communicates through a speech generating device like that used by the famous physicist Stephen Hawking, activated using a chin switch. James described how this technology, and later email, opened up educational possibilities for him, enabling him to earn a first class honours degree in Communications Studies. His journey was not without difficulties however, such as when he developed scoliosis from twisting his back in order to reach his keyboard, forcing him to change to using a chin switch.

The experiences described by these two students illustrated how people with disabilities face great difficulties accessing education, but many of these barriers can be overcome with the help of digital technologies. However, they also revealed that the barriers come from many different places, sometimes including technology itself, and that there are many different people, from technology developers to content providers, who have a role to play in helping eliminate or circumvent those barriers.

Roles of stakeholders in preventing digital exclusion

After hearing from the students, audience members were invited to get together in small groups to discuss how digital barriers arise and how they can be prevented. They were specifically asked to identify where the impact of digital technologies on students comes into their own spheres of influence, where they thought this had relevance to their own specific roles and what they could do themselves to improve the situations. Issues reported back from the groups ranged from the policy level – the need to adopt a systemic approach embedded within the forthcoming National Digital Strategy – to the support level – the need for those working at 2nd level to liaise with those at 3rd level and the need to provide employers with easily digested resources of information and guidance.

What Does Multiple Intelligences Theory and Practice Have to Offer Universal Design for Learning?

Dr. Brian Butler, Advisor for Inclusive Teaching and Learning, Disability Support Service, University College Cork with Dr. Marian McCarthy, Ionad Bairre, The Teaching and Learning Centre, University College Cork.

This paper looks at Multiple Intelligences theory as a valuable informant to pedagogical reform in the classroom and highlights its benefits in helping to create different entry points to learning for all students. It outlines, in particular, its use in creating a more inclusive classroom for students with disabilities by encouraging a learning environment that adheres to the principles of universal design for learning. When the tools and entry points of Multiple Intelligences (MI) theory are implemented via the pedagogical framework of Teaching for Understanding (TfU), a learning environment conducive to Universal Design for Learning (UDL) is created.

What is Universal Design for Learning?

The seven principles of Universal Design were originally drawn up by a group of architects, environmental engineers and product designers to promote access to buildings, to the environment, and to everyday products and technology, by the widest number of people at a reasonable cost. The principles would promote a design mentality to address all needs from the design stage, avoiding 'retrofitting'. Such principles can be used to evaluate existing structures and products, to review the design stage and educate both designer and user. Many third level institutions have looked to the seven principles of universal design in an effort to reach out to the growing diversity of student learning in and beyond the classroom. Changing demographics, developments in technology, social attitudes, new equality and disability legislation, as well as up to date pedagogical perspectives, are creating pressures that insist that diversity be addressed in the classroom. The principles of universal design are viewed by many as a key solution to addressing such challenges.

Teaching Support Services at the University of Guelph began a study in 2002 to establish how teaching and learning in third level could benefit from Universal Instructional Design (UID). The team then began work with faculty to help bring about changes in curriculum to help establish universal design in the

classroom (Yuval *et al.,* 2004; Zeff, 2007). Around the same time, a team of faculty at the University of Connecticut was also working on the application of universal design to higher education (McGuire, Scott and Shaw, 2003) and have attempted to take a theoretical approach in the application of universal design to instruction in the classroom, coining the term universal design for instruction (UDI). This involved the implementation of instructional methods that created an inclusive learning environment for all students, including students with disabilities. Sheryl Burgsthaler (2013) and her team at the Adaptive Technology Lab of the University of Washington have also done much work on the role of technology in the classroom and have provided a range of on-line resources to inform faculty about how to address the needs of students with disabilities from a universal design perspective.

This paper will focus more, however, on the work of Anne Meyer and David Rose of the Centre for Applied Special Technology (CAST) at Wakefield. CAST is a non -profit research and development organisation dedicated to the promotion of inclusive education through the framework of universal design for learning. CAST view the principles of UDL as different to the principles of other domains of universal design and do not work from the original seven principles applied to the environment, architecture and product design. Based upon detailed research, three basic principles of UDL have instead been drawn up by CAST. These three principles reflect a strong focus on learning and are required to address the dynamic processes of teaching and learning and not the fixed structures of buildings. (Rose *et al*., 2006, 13).

The Three Principles of Universal Design for Learning.

The first principle is *multiple means of representation*. There is no one way of presenting knowledge that will be suitable for all students. Teaching a student with a print disability, such as visual impairment or dyslexia, is an obvious example; but all students have individual ways in which they perceive and comprehend knowledge and therefore have individual preferences in the ways in which they like knowledge to be presented. Multiple means of representation is, therefore, key to ensuring that all students can recognise the knowledge being presented to them. This principle has a large impact on teaching methods and materials and emphasises the forms in which knowledge is presented to the learner. Accessing information is not, however, enough. The essence of learning is in how the learner realises how to use knowledge and how to make knowledge

work. Bringing the learner to this place is the central challenge of teaching and learning.

The second principle is *multiple means of expression*. Students like to express knowledge in a range of different ways. Some students express knowledge much more easily and coherently through one medium rather than through another. It is also important for a teacher to realise that different students work better when using one mentoring style over another. Some will prefer regular feedback on their work, while others prefer group review sessions. Others will require more background reading on a topic, while others may wish additional reading material. A variety of scaffolding and support strategies is therefore required to encourage students to express themselves in a way that brings their individual learning forward.

The third principle is *multiple means of engagement*. Students differ greatly in the ways in which they are motivated to learn. Teachers are free to draw upon a range of teaching methods to encourage a student to engage with the knowledge being presented. It is in personalising knowledge and in being able to relate knowledge to one's own place and experience in time that one will develop an appetite for knowledge. A teacher can encourage this in a range of different ways. Some students will like spontaneity in a teaching session, while some may feel uncomfortable with it. Other students like a social aspect to learning and react very positively to an interpersonal approach. The ways in which learning is rewarded can also impact on how well a student will engage with the learning (Rose *et al.,* 2006, 14-15).

The neuroscience behind the principles

The three principles are based upon the evidence of neuroscience and relate to the brain's use of three separate areas during the learning process (Rose *et al*., 2006, 11). These three areas of the brain are important to memory, language processing, problem solving and thinking in general. The first area is the back part of the brain and this is used to recognise patterns or events in the world around us. It draws upon information provided through the senses, such as visual, tactile, auditory, etc. It is in this part of the brain, for example, that we recognise the words and sentences in a book. If damage or underdevelopment has taken place in the posterior cortex an individual will display one or more recognition

difficulties. Examples of such challenges are difficulty with letters, such as dyslexia; or difficulty with numbers, such as dyscalculia. Imaging on the brains of people with recognition difficulties, such as these and others, have shown atypical patterns of activity in the posterior cortex (Shaywitz, 2005; Rose *et al*., 15).

The second principle is based upon strategic networks in the brain, which are located in the anterior part of the brain otherwise known as the frontal lobes (16). This area of the brain is where an individual plans, conducts and monitors their actions. Because the anterior section of the brain is crucial to all our plans and actions, it is important in actively reading, writing and planning written exercises. This type of brain activity is highly patterned and works in concert with the recognition patterns of the posterior cortex. If the ability to generate patterns is affected in this frontal area of the brain a person's ability to plan and complete specific actions becomes compromised. Difficulties in this area can interfere with a person's ability to actively study a piece of text and may also interfere with the ability to organize, plan and write up an assignment. (Rose *et al*., 2006,16; Fuster, 2002; Goldberg, 2002).

The third principle of UDL is based upon the affective networks operating at the core or extended limbic system of the brain. These networks do not generate patterns, but are responsible for emotion and affect and determine what patterns we perceive which matter to us. They help us decide what actions we wish to follow. They do not help us recognise an object or piece of text, but they do help us decide whether an object or piece of text is important to our needs. The affective networks are central to learning and determine why one item or piece of information is important to one person, while another is important to someone else (Damasio, 1994; Lane and Nadel, 2000). This can be easily demonstrated in the many different ways in which each individual looks at a piece of art, such as a picture or a sculpture. The affective networks are important in the selection and prioritizing of data and play an important role in the learning process. Each individual has their own personal history and many do not share the same social and cultural background. These facts can have a great impact on affective networks working in the brain (Rose *et al*., 2006; Chita-Tegmark et *al*., 2011)

All three networks play an essential part in learning. The important point in identifying this process is that it is a constant reminder of what needs to be done if accessible learning is going to take place. It is not just enough to make classrooms and text books accessible, effective learning environments need to

address three main issues. They need to provide information and informational supports that are accessible to all students, provide ways of acting on information that are accessible to all students and provide ways of engaging and motivating learning that are accessible to all students. The UDL principles reflect those 3 aspects in the design of learning environments (Rose *et al*., 2006, 17).

The principles of UDL impact on the design of course goals and objectives and on how the teacher works to bring these about. A broader understanding of goals is required to inform curriculum design and variety in teaching materials, teaching methods and assessment methods. It is not just enough that students acquire information, but they will also need to express what they know. Students need to be seen to perform with their newly acquired knowledge, for it is in the expression and application of knowledge that it begins to become useful. It is, therefore, important that goals and objectives have an expressive component, since it is in such expression that knowledge becomes useful for application in the future. The second principle of UDL, therefore, is a reminder to us that there must be multiple means of expressing knowledge and that there must be multiple means for learning the skills required to support that expression. The third principle of UDL is equally as important to course goals and objectives. No student will use or apply knowledge that they are not interested in, or for which they have no value. An important goal of the course must be to empower students to want to learn and to enable them to develop and make use of this knowledge when they leave the course. The teacher needs to constantly evaluate engagement and work to improve motivation within the class. This can be assisted by teacher observation and class feedback (Rose *et al*., 2006, 18).

The importance of a curriculum based upon variety and flexibility cannot be underestimated. If the curriculum provides one means of representation, expression and engagement many students may be prevented from successfully completing the learning outcomes of the course. The achieving of a learning outcome can be made difficult for a student not because of the learning goal required by the course, but simply due to the limited means of expressing the skill provided to the student. You can make almost any goal inaccessible by unnecessarily limiting the means for reaching it (Hitchcock *et al*., 2002, 4). Students with disabilities, in particular, can find a learning outcome insurmountable simply because the teacher has been unable to separate the goal from the means of achieving it. Similar to Howard Gardner's Multiple Intelligences

theory, the principles of UDL reject the concept of one general intelligence, as such principles are based upon a neuroscience that proves that each brain learns differently.

What is Multiple Intelligences theory?

Howard Gardner developed multiple intelligences theory in a move which both challenged and rejected the accepted assumption that intelligence consisted of a single general intelligence which could be measured in an IQ test. The theory also challenged the assumption that a person was born with a certain level of intelligence which remained static throughout their lives (Gardner, 1983; Gardner 1999a; Gardner 1999b; McCarthy, 2011, 103). At a time when Howard Gardner was working with brain damaged adults and gifted children, he became acutely aware that people have a wide range of capacities and that a person's ability in one area does not ensure ability in other areas. Some students may be very capable in one area of study, such as music, and may have difficulties in another area, such as technical drawing. Gardner, therefore, perceived the brain not as an instrument having one general ability, but as having a whole range of individual capacities working in unison and interacting together in a non predictable way (Gardner, 2009, 3-5; McCarthy, 2011, 106-7).

In defining intelligence Gardner moved away from the assumption of a general intelligence and instead asked what are the mental abilities that support the wide range of adult roles found over time and across cultures? This definition looked at the culture of a people and the everyday skills and demands from the society that created this culture, and defined intelligence in these terms. This looked at the intelligence of everyday life and, unlike conventional opinions on intelligence, did not look at problem solving skills alone, but also the skills required to build and create. Gardner's final definition of intelligence is as follows: "The bio-psychological potential to process information that can be activated in a cultural setting to solve a problem or fashion a product that is valued in one or more community or cultural settings" (Gardner, 1999b, 33-34; Gardner, 2006; McCarthy, 2011, 108-9).

In setting criteria to identify the intelligences, Gardner turned to several disciplines including psychology, neurology, biology, sociology, anthropology and the arts and humanities. Before attempting to identify the intelligences, Gardner was stringent to set clear empirical criteria by drawing on these disciplines, the

details of which will not be discussed here. The eight intelligences finally identified by Gardner are as follows: linguistic, logical/mathematical, visual/spatial, bodily/kinesthetic, musical, interpersonal, intrapersonal and naturalist. A ninth intelligence, described as existential intelligence, is currently being considered as being a separate intelligence also (Gardner, 2009, 5-6; McCarthy, 2011, 110-117).

MI and teaching

When Gardner published his *Frames of Mind (Gardner, 1983)* and first shared his theory with the world it began to attract great attention from educationalists. Though published as a psychological theory, its impact upon education was to be far greater than its impact upon psychology (Gardner, 2009, 6-7). The MI *meme* – a meme is a unit of meaning created at a certain place and time that has spread widely- began to work its way into many educational cultures and has impacted educational policy in a variety of ways, in a variety of settings (Kornhaber, 2009). Different educational cultures and settings approached the MI *meme* according to their background and readiness to accept new ways of thinking (Chen, 2009, 386-96). However, Gardner did feel it was important to dispel common misunderstandings taking place in education with regard to MI theory by pointing out that an intelligence is not a learning style. Styles are the ways in which an individual student may approach different tasks, whereas an intelligence is a computational capacity whose strength varies across individuals; it refers to the way we process information, rather than how we take it in, which is a matter of style (Viens and Kallenbach, 2004, 19). Various intelligences can be employed in a number of disciplines and strength in a particular intelligence does not determine what discipline it will be used in. Neither does a level of strength in an intelligence remain static, but can be developed depending on the person and the character of the learning environment. A person should never be described in terms of a particular intelligence. We all share the whole spectrum of intelligences and intellectual strengths change over time, depending on experience and practice (Gardner, 2009, 7-8).

After twenty years of studying the educational impact of MI theory upon education, Howard Gardner felt that two impacts were of the greatest importance (Gardner, 2009, 9). Firstly, teachers should take differences in students seriously and craft their teaching to ensure optimal learning opportunity for each student. It is also worth noting that Gardner also points out that

technology can play an important role in making this challenge possible. Secondly, any skill or concept of significance should be thought in a variety of ways. Such teaching methods should address different intelligences or combinations of intelligences. This has the positive impact of ensuring that a variety of approaches will reach a variety of students and also provides for a deeper more rounded understanding of a topic. Also, if a student can think of a topic in several ways s/he demonstrates a true understanding of that topic. As witnessed above, these concepts are shared with the principles of UDL, which acknowledge the individuality of each learner and the need for variety in materials, teaching methods and assessment methods. This ensures multiple opportunities for the representation, expression and assessment of learning and understanding.

MI and students with disabilities

Kornhaber (2009, 375) has claimed that as an instrument of policy, when soundly implemented, MI acts as an agent of cognitive equity enabling diverse groups to use their minds well. It ensures the development and expression of ideas by groups that otherwise may not be heard. In educating children with disabilities, teachers who have adopted an MI approach to teaching have moved away from a deficit approach to their students and become more positive in recognising a wider range of learning potentials. This has been confirmed in evidence relating to teaching children with disabilities in Australian schools (Vialle, 2009). Teachers who have adopted an MI approach have claimed that they examine their students more closely and look for the student's strengths rather than responding automatically to a student's deficits.

Multiple Intelligences theory is a descriptive, cognitive theory of intelligence, and, as such, does not provide a pedagogical framework, but is rather a set of tools or a mindset that a teacher can draw upon. These tools provide several entry points to learning for the teacher in which a curriculum and its delivery can better reach a wider range of students in the classroom. The entry points suggested by Howard Gardner are: narrational, quantitative/numerical, logical, existential, aesthetic, experiential/ hands on, and social. Different students learn in different ways and a teacher is required to adopt a variety of entry points to learning if the widest range of students is to be reached. A pedagogical framework is, however, required to provide a structure in which to employ the various entry points to learning. Teaching for Understanding (TfU) provides a pedagogical framework with both the structure and flexibility to

employ the entry points to learning in a manner in which a wide range of learning preferences can be addressed.

What is Teaching for Understanding (TfU)? A performance view of understanding

Project Zero, at the Harvard Graduate School of Education, has set up many research projects to help inform understanding and enhance learning at all levels of the education system. These projects include a strand of research called *Teaching for Understanding*. The TfU framework was developed from research at Harvard and took place between 1988 and 1995, in collaboration with a group of researchers and several teachers and their settings outside the university. Understanding a topic, in this context, is defined in terms of being able to perform flexibly with the topic and being able to explain, relate and apply the knowledge concerned in a new situation. (Perkins, 1998; McCarthy, 2011, 52).

Perkins highlighted the lack of real understanding taking place in teaching and learning in both the Humanities and the Sciences (Perkins, 1993, 30). He promoted a performance view of understanding which reflects the general spirit of a constructivist approach to learning, which posits that knowledge is a construct built by the student and not a product given to the student. By defining the idea of performance in constructivist terms, Perkins claimed that to understand knowledge fully cannot mean that the learner understands the knowledge in a representational way, implying that s/he has an image or mental model of the knowledge only, but that the learner must also be able to perform or play with the knowledge freely and easily. Perkins describes this active learning process as *an understanding performance* or *a performance of understanding* (Perkins, 32, 33). Perkins claims that most classroom activities are too routine to be understanding performances and that though these activities have their own role to play, they are not performances of understanding. They do not enhance understanding in the student and take the learner beyond what he already knows.

The mainstay of learning must, therefore, be actively engaging with the topic, in a way that involves reflective thought and feedback. It is important to be able to think in different ways with the knowledge and be able to apply the knowledge to different situations. Perkins highlights that this does not happen on its own, but takes careful planning and thought. Engagement with the knowledge must involve

guided performances with regular feedback to ensure real understanding can take place. It also implies that the teacher must scaffold and facilitate the learning, using multiple ways of representing the knowledge, through a variety of entry points, analogies and metaphors, providing the student with multiple ways of expressing the knowledge, through a variety of assessment processes.

The elements of TfU

How does a college teacher ensure that teaching for understanding is taking place in his/her classroom? Research at Harvard has demonstrated that it is important that a TfU approach contains four key elements: generative topics, understanding goals, performances of understanding and continuous assessment (Wiske, 1998; McCarthy, 2011, 76-89).

Firstly, the teacher must decide what topics are worth understanding. Generative Topics are topics which generate knowledge about the course or module. These consist of concepts and themes that help students acquire a significant understanding of a selected topic. It is important that generative topics be central to the discipline, interesting to students, accessible to students via a variety of entry points and suitable for multiple connections with other topics on the course.

Secondly, the learning must take place over an extended period of time in which it is possible to set specific goals. It is good that these goals be centered around carefully drawn questions, which can help retain focus if repeated occasionally throughout the learning period. Goals need also be explained or presented to students in an unambiguous fashion and in a way in which the variety of entry points to learning is considered.

Thirdly, it is key that the teacher employs teaching methods that promote a performance view of understanding in the classroom. This ensures that students are given opportunities to perform with and apply their newly acquired knowledge. In turn, this provides opportunities to allow students to demonstrate and develop their understanding of the subject. By considering a variety of entry points to the learning, the actions of doing and thinking can ensure a solid grounding and clear understanding of the knowledge concerned. This will require multiple forms of expressing knowledge as each student will shine in his/her learning when given the opportunity to do so.

The fourth element demands that assessment take place throughout the learning period and not just at the end of the module or course. Formative as well as summative assessment is essential to inform the teacher of a student's progress and also to provide students with an opportunity to reflect upon their learning. Formative assessment is where performances of understanding can be measured and provides the opportunity for intervention should it be necessary. Drawing on Howard Gardner's entry points to learning creates a variety of opportunities in which a student's expression of knowledge can be nurtured and assessed. Variety and flexibility in assessment practice helps address a wide spectrum of learners and gathers valuable feedback data to help address any issues learners may have. Also, peer and self-assessment can be used, once clear criteria of assessment are laid down, and this helps take undue pressure off the teacher. In summary, Multiple Intelligences theory becomes part of the learning environment when a variety of entry points are applied to mediate what is to be understood.

Drawing it all together

Teaching for Understanding facilitates a flexible but effective pedagogical framework through which the tools or entry points of learning can be employed, and encourages a wide spectrum of performances of learning. The variety of entry points to learning and the flexibility of the structure also help to ensure that the principles of Universal Design for Learning are adhered to. Multiple forms of representation are created through the multiple entry points to the generative topics of the course and by the variety of ways in which these topics are presented to the class. Multiple forms of expression are employed in the variety of performances both during the learning and assessment period. It is during a student's performing of learning goals that they come to see their own development and grow in confidence. Through performance and expression, formative and summative assessment take place and a student receives the feedback required to grow in learning. Opportunities for multiple forms of engagement are presented by stimulating students via learning goals that facilitate multiple entry points to learning. By acknowledging the individuality of each student through their academic, personal, social and cultural strengths, the variety and flexibility made possible through MI and TFU can accommodate the principles of UDL**.**

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Breakout/PC Café Sessions

A New Approach to Fostering Independent Learning in First Year Students with a Specific Learning Difficulties

Dr. Lisa Padden, Learning Support Tutor, Julie Tonge, Disability Adviser, University College Dublin

The UCD Access Centre was established in 2010 and amalgamated the previously distinct units of the Disability Support Service, UCD New Era and the Mature Student Adviser. The Access Centre delivers a range of initiatives to support widening participation in UCD including outreach, admissions and student support. The Access Centre has four full-time posts which are specifically dedicated to supporting students with a disability. In a context of rising student numbers the staff available to support these students is at an all-time low. Students with a Specific Learning Difficulty are the largest cohort of students requiring disability support the unit recognised that some of these students struggled with the transition to third level. These difficulties were addressed by two part-time learning support tutors who would meet with students on a one-to-one basis and assist them with the skills they required to successfully engage in their chosen course of study. While a number of students were clearly benefitting from this service, and used it frequently, there was a larger number who were getting little or no support due to the unavailability of appointments. Often by the time a student received a learning support session they had already encountered significant difficulties and some had started to disengage with their studies. Other students were waiting for an appointment with a learning support tutor to address a difficulty which could have been solved by a mainstream support; such as the Maths Support Centre or Academic Writing Clinics. The Access Centre required a new approach that would ensure all students could get access to support at the point of need and that the type of support provided would foster independent learning so that students would not be reliant on the service for the duration of their degree programme.

We invited Dare student with SLDs, Mental Health Difficulties and ADD/ADHD to a tailored orientation which took place prior the general UCD orientation which all students must also attend. At the end of the orientation we held a parent's evening to explain the process of registering with the Access Centre and address any questions the parents might have. The orientation began with a campus tour; each group was given a tour by their leader(s) and this time gave the groups a chance to get to know one another outside of the lecture theatre where most of the orientation activities took place. On the first day students took part in a Transition and Study Skills workshop; this focused on telling the students what to expect at third level and providing useful methodologies for achieving success in the first semester. This workshop linked in with the learning support workshops which were subsequently provided throughout the first semester. Students were told how to register for these workshops at this stage – details were also provided in their handbooks.

Orientation also consisted of a careers workshop – specifically focused on students with a disability, a motivational lecture from Dr. Aidan Moran, an introduction to and registration for the mainstream supports available for all students in UCD, a workshop on module registration and assistive technology training. Assistive technology training took place on the last day of orientation. All students were supplied with literacy software, a smart pen and extensive training in the use of both. Students also made an appointment to attend for their Needs Assessment on the last day of orientation. The feedback was overwhelmingly positive with respondents noting that the orientation had indeed helped them to successfully transition to third level study.

As mentioned above, the Access Centre provided a suite of five learning support workshops throughout semester one. The workshops covered note-taking, study skills, academic writing, research skills and exam preparation. All first year UCD Arts students also take 'Introduction to Arts' which is based on Palgrave's Skills4study programme; it was useful to know what material the students were already covering and therefore not duplicate any exercises. An important element of these learning support workshops was the use of UCD's Online Learning Environment – Blackboard. The Learning Support Blackboard Module appears alongside all of students other modules and is a useful tool for providing information and communicating with students. One suggestion for improvement

offered by students was that more subject-specific material be covered in classes – this is something that we are looking to address in future workshops.

Attendance at the workshops was good. Requests for one-to-one learning support have been significantly reduced with only two students who attended workshops also requiring one-to-one support. There have been no complaints about learning support from semester one and parental interaction with the Access Centre has been greatly reduced. An analysis of first exam results also showed that the more workshops attended by students the more likely they were to pass and the fewer attended the less likely they were to pass. It was also noted that only nine new entrant first year students failed three or more modules in the first semester this year compared with fifteen in the previous year.

Improved interaction with academic staff has been an important part of our new learning support strategy. Overall we have increased communication with academic staff. We requested the input of departmental teaching and learning representatives when composing our new guidelines on supports for postgraduate students. We provided a session on DAWN Marking Guidelines for module coordinators/examiners. We also facilitated a HR lunchtime session for all staff on the role of the Access Centre and the role of staff in supporting students with a disability. We also plan, in collaboration with colleagues in Teaching and Learning, to put on a workshop as part of the UCD Teaching and Learning Diploma, as well as a standalone workshop advertised by teaching and learning.

Our plans for the future are based on the creation of independent learners. We are making plans for the new intake of students in August 2013 and will incorporate the feedback provided by this year's students. We continue to offer workshops on demand for students when a relevant topic is proposed. We are also continually looking for new technologies which may help students to become more independent while at college and for their future careers. We are currently trialing a new smart pen and proofreading software. We also aim to build on our relationships with Academic staff. An important aspect of this plan is to request departmental liaisons who will work with the Access Centre to improve student experience. Overall we feel that this year's new approach had a positive impact on the experience and performance of first year students and look forward to developing this approach further in the years to come.

De-mystifying MOOCs: The lost opportunity of Massive Open Online Courses to enhance accessibility of Higher Education content and teaching

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Massive open online courses have captured the imagination of some online educationalists, technology journalists and higher education institutions who see the potential this type of education offers for raising revenue, advertising and research into online learning (Ref 1). Sir John Daniel in this analysis of the 'educational buzzword of 2013' differentiated between two types of MOOC: constructivist cMOOCs and the xMOOC as typified by current providers such as Coursera and Udacity (Ref 2). This paper focuses on the xMOOC and subjects courses offered on both platforms to a review rubric to assess the pedagogy, accessibility and Universal Design for Learning compliance of several courses offered by several higher educational institutes.

The growth in informal learning was another feature of online education in 2012 albeit one, which received far fewer headlines than MOOCs. In an educational context informal learning is a term used to describe learning through self-study without instruction or teachers (Ref 3). Several websites have offered vehicles for informal learning online and this study will subject two of these, CourseHero and Lynda.com to the same analysis as the MOOCs.

Four members of UCC's Teaching and Learning team took part in this study which examined courses under four headings: user interface, presentation of content, pedagogy and student perception. During this study the team enrolled in the following courses: Drugs and the Brain (Coursera), Fundamentals of Online Education (Coursera), Image and Video Processing (Coursera), Web Development (Udacity), Statistics (Udacity), Introduction to HTML5 (Course Hero) and Introduction to Photoshop (Lynda.com).

How technologically accessible are these courses?

Udacity and Coursera courses are available across a variety of devices – desktop, laptop, tablet and smartphone allowing learners to access the content on their own devices. Udacity renders well in mobile browsers whereas Coursera provides an iOS app. Course Hero and Lynda courses are also available on portable devices.

Lynda has an iOS app although accessibility features such as subtitles are not available on iOS devices.

Bandwidth issues are apparent however. On poorer connections including mobile broadband the video buffers slowly and impedes the learning experience. The Udacity courses examined deal with Web Development and Statistics and provide the option to download all of the course videos which can then be viewed using VLC player. Textual content is typically not downloadable. Coursera offers a similar download feature but the size of files involved led some participants to complain about download times. The same bandwidth issues impact on Course Hero and Lynda where buffering is evident at low bandwidth.

Are the Learning Outcomes of these courses clearly articulated?

Udacity courses clearly state the learning outcomes of the course. Coursera leaves such decisions to the higher education institute providing the course content which means that the learning outcomes are present in some courses and not in others. There seems to be little in the way of pedagogical input from Coursera into the design of MOOC courses hosted on the platform which in itself represents a missed opportunity to embed some key standards throughout. Of the informal learning websites Lynda.com presents learning outcomes as headings and does not delve into too much detail. Course Hero does not provide any formal or informal learning outcomes.

How Accessible are these MOCCs and informal learning websites?

As with learning outcomes there is a wide variety of accessibility standards evident in MOOCs and informal learning. Udacity provides for content to be downloaded apart from wikis and forums. Subtitle files are available for video files in most cases. Coursera offer a similar provision although it seems that the subtitles offered in videos are rendered by text to speech software and are therefore inaccurate at times. Lynda.com provides close captioning of their videos when access directly through a web browser but not in the iOS app. Course Hero provide the least accessibility features and by curating video content from across the web provide a more disparate and inaccessible learning experience due to various narrators and styles.

How UDL compliant are these MOOCs and informal learning websites?

The more idealistic analyses of MOOCs and online learning generally are that through greater provision more people will have access to high quality learning materials. However, the majority of MOOCs rely on a standard methodology rather than pedagogy which is the standard one hour lecture broken up into ten to fifteen minute sections with quizzes in between. The moods have missed the opportunity to make content available to students with varying learning styles. Udacity and Coursera rely disproportionately on video as the means of delivery which provides a singular path through the course which is not UDL compliant. From anecdotal evidence, A Coursera course run by the University of Edinburgh has purposely steered away from this video driven format in favour a more community focused approach. This in turn created accessibility and UDL issues as this community coalesced on social networks such as Facebook, Google Plus and Twitter and collaborated on resource creation using freely available online tools which for the most part are inaccessible or heavily dependent on good bandwidth. Informal learning sites, Lynda.com and Course Hero are not UDL compliant and provide a singular video dominated route through content.

MOOCs: a lost opportunity?

MOOCs and informal learning as their respective current incarnations online are not providing examples of good practice in online pedagogy, accessibility or online learning. The lack of contact with instructors leads a motivational problem for some students. Assignments are either peer graded or machine graded and provide little of the detailed student feedback evident in most higher education institutions. Diane Laurillard of the Open University, presenting at the recent 'Disrupting Higher Education' symposium in Trinity College Dublin made the telling point that educationalists had not yet developed a pedagogy or system that moved higher education away from the need for 1:25 staff student ratio. That may very well be the case but does not mean that MOOC and informal learning providers cannot alter course content development to better implement good practice in accessibility and compliance with Universal Design for Learning guidelines.

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Designing Teaching and Learning Materials: Transitions from default to universal design

Ron Hamilton, Dr. Marion Palmer and Nicola Fox Hamilton (Institute of Art Design & Technology, Dun Laoghaire)

"Good design is as little design as possible: less, but better – because it concentrates on the essential aspects, and the products are not burdened with non-essentials. Back to purity, back to simplicity"

(Dieter Rams, from the 10 principles of good design developed during the 1970s).

This paper describes an emerging picture brought into focus over the last 18 months through a series of flexible learning strategies developed and implemented as part of the ongoing activities of the IADT Teaching and Learning Committee. Specifically, the focus is on the design of learning materials, and the various people involved in their making; a small community that includes different staff members engaged either directly or indirectly in teaching.

Default Position:

In this context default refers to passive situations where the decisions are already made through the software used; such as default fonts, sizes, and styles. When the default position is adhered to there is little difference in the appearance of things; it can all end up looking the same, like the ubiquitous word document.

The Collins online dictionary defines default as to "fail to fulfill or perform an obligation". Merriam-Webster defines default as "a selection automatically used by a computer program in the absence of a choice made by the user".
The obligation in designing teaching and learning materials is to make them as accessible as possible to the greatest number of people, while accommodating their different requirements. By choosing not to consider the options available in presenting those materials, such as type, colour, and arrangement of information through the application of grid and white space, there is a failure to fulfill that obligation.

Universal Design in Practice:

Adopting Universal Design (UD) as an approach provides a framework to support the fulfilling of 'obligation' and facilitation of 'choice'. It is an opportunity to present multiple ways to transform a piece of word processing into a piece of good design. The plan involved the development and implementation of a framework that includes three of the seven UD principles:

1 Flexibility in use: The design accommodates a wide range of individual preferences and abilities.

2 Simple and intuitive to use: Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or education level.

3 Perceptible information: The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

Transitions in Practice:

There are two stages to this implementation. The first is to establish a UD framework based on the three principles that supports an integrated approach amongst the staff members who are involved in generating learning materials. The second is to foster and develop a culture that implements and sustains the application of UD principles in practice.

Implementing stage 1:

A number of strategies were employed to support the first stage of implementation, including.

1 By example: Teaching and Learning Committee — promoting a universal design approach.

2 Through legitimate peripheral participation (Lave and Wenger, 1991).

3 Design workshops.

Through the various initiatives the aim is to promote good design practice, not just about how things look, but how things work, informing how content is understood, communicated and transmitted. While the three initiatives may appear separate they are not, they have an integrating effect and all those involved experience the three initiatives at some point. They reiterate the same underlying message and aim to promote an attitude based on the execution of simplicity through the application of design. Starting with the end user in mind the aim is to achieve the simplest and clearest expression of content through the use of visual communication, typography and design.

1 *Teaching and Learning Committee — Promoting a Universal Design Approach.*

First, by example through the design of teaching materials generated by the Committee that have a promotional or information role. Second, by providing design workshops for staff. Finally, by assigning staff to projects with the inclusion of design expertise.

2 Community of Practice: legitimate peripheral participation

The distinction here is between designer and non-designer. The majority of staff involved in this project are not designers. What they do have in common is membership of the IADT Teaching and Learning Committee and a willingness to be involved. This small community is rich in diverse experience and skills. When design opportunities arise, a small project team is put together and assigned a designer. As the project evolves, and working from existing experience, interventions are made by the designer where appropriate to establish good design practice. Through an iterative process, choice building and decision making based on design principles are explored, developed and documented.

3 *Design Workshops:*

The workshops are designed to introduce participants to basic design principles in a way that they can bring into their day to day work and implement across a variety of platforms. Two types of workshop have been run, an in-depth academic poster design workshop over six or nine hours, and a shorter two hour introduction to design for presentation and teaching materials. In these workshops core elements of design, such as the use of grids, information hierarchy, story, type, colour, and imagery are activated through practical exercises that teach participants how to consider the visual in their work. The

output from the workshops includes the application of a new design to a project or document, and it is hoped that the skills learned would be applied across all materials created by the participants moving forward.

Implementing stage 2:

The project is currently working it's way through the first stage. On completion of Stage 1 a number of case studies and reflections on project work will be documented to support, evidence and map progress, while establishing a case for an emerging culture of Universal Design in practice. This process of documentation will also provide material based on best practice to facilitate the production of a series of guidelines. These can then support the ongoing development of a Universal Design culture in practice.

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E-learning in Education (Delivery of effective online learning)

James Northridge, University College Dublin/UrAbility.com

This presentation will demonstrate how to create and deliver short, high impact learning messages to students. It will give an overview on how to best apply the learning goals, college/school culture and use the technical environment that is available online. The presentation with combine creative design, story-telling software and the latest learning technologies to develop e-learning that has an impact in an educational setting.

It will benefit education providers to develop skills in the design and delivery of effective online learning while ensuring that they meet all the required accessibility standards. A full review of current practices in use, along with a demo of some software and how we can best build an online course and support the student experience at the same time.

The key message of this presentation will be how to deliver online learning using a blended learning approach; this offers much more flexibility to learners using a number of technologies.

A case study of how UCD are implementing elearning and are they will be able to offer a full-time masters in sciences for 2013.

Embedding Universal Design in the Curriculum

Margaret Kinsella, Institute of Technology, Blanchardstown

This presentation is based on storytelling, entitled *'Once Upon a Clothes Line'* and attempts to tell the Universal Design story within the Institute of Technology, Blanchardstown. The narrative is told through photo slides and mini-performance. The stage/arena is the college and the characters are the lecturer and the student with the drama focusing on the teaching and learning, the module content and student assessment and the finale summarizing the universal design for learning methodologies used. The module content centers around equipping students with the rationale, motivations and issues for universal design and in the first instance allowing students to connect with universal design (and therefore connect with real people and real issues); initially in their own lives, and subsequently in the greater communities, in the endeavour that this will allow for more effective follow on when looking at interaction design in their professional lives as they move through the degree course.

A *clothesline* is physically constructed (using a Croke Park conference centre coat rail!) and subsequently used to *'hang items on'* to tell the universal design story. The initial photo slides and corresponding clothes line artifacts introduce the **lecturer identity** (background, family, education and career: industry, specialist, mainstream and continuing education third level teaching).

The next set of photo slides and *clothesline* artifacts represent the **college identity**: the mission statement and the story of diversity, disability and access, first year experience and transitions and more recently the universal design tale. Universal Design is a first year module on the Creative Digital Media BA degree programme. Other related modules are Personal Development where individual and group identity feature and Visual Creativity where expression and creativity abound; introduce themes in Semester one which are further elaborated in Universal Design, which is placed in Semester Two.

Core universal design issues are presented using examples from personal life to illustrate how **good design** can be enabling and effective and how **poor design** impedes and burdens. Examples portray **assumptions** and their effect on design and the huge significance of consulting **'real' users** and the development of **personas**.

To give a sense of the integration of photo slides and artifacts – an example might be the opening slide which is a photo of an *outside clothesline* blowing in the wind and move next to the traditional countryside *clothesline* in the kitchen over the 'AGA' cooker (introducing the fundamental **daily living tasks**). Family of origin is introduced in parallel with life span development and eludes to the many **transitions** and **adjustments** made from toddler to elder years. Samples of product development for each **lifespan stage** are depicted.

Student identity and **community identity** are cast as a significant part of the module and expands for a main **assessment** component. Student **lab work** and assessment centers on making universal design **real**. A sample assignment brief is provided at the workshop, as a handout, with multiple print formats and layouts. This first assignment is challenging where students are asked to consider people and design. Student projects are available for review alongside student testimonials.

Substantial module content was developed in partnership with **DIT** (Dublin Institute of Technology), **NCBI** (National Council for the Blind in Ireland) and **CEUD** (Centre for Excellence in Universal Design).

Additionally universal design experts and end users visit the college and contribute to the students and the module; these sessions are frequently recorded and integrated in the next delivery of the module. For example a workshop by DIT Kevin Street with ITB students on the **Seven Principles of Universal Design** was recorded and now made available to current students using Dropbox. **Web accessibility** is introduced in year one and expanded further in subsequent years of the programme, with **CFIT** contributing workshop facilitations, materials and resources.

External workshops play a powerful role in ensuring content is *real* to students such as the following:

- **AHEAD** contribute important workshops on '**navigating and negotiating disability'** and incorporate appropriate use of **vocabulary** and **terminology**.

- **An Draiocht** theatre workshops on identity and personal representations

- **Enable Ireland** trips with talks and assistive technologies demonstrations.

- **NLN** (National Learning Network) discussions on **assistive technologies** and **specific learning disabilties.**

- **Experts** introductions to Braille and Irish Sign Language.

- **User experience** panels and seminars

- **Irish Guide Dogs** talks, fundraising and dog photo shoots

The closing remarks highlight the **storytelling approach** as a method to engage students, linking the universal design module content with real narratives. Examples of the **universal design for learning principles** used in the delivery of the module are also highlighted. **Sample student assessment** work is included on the *clothesline*. This component is significant as it demonstrates the **students' interpretation** of universal design and the significance of design in people lives. **An invitation** is extended to query the audience re possible adaptations to the existing *clothesline* story on universal design for possible future workshops.

How student unions can play an important role for accessible Higher Education Institutions

Tina Wilhelmsson, The Swedish National Union of Students

The Swedish National Union of Students (SFS) has a project to make student unions accessible for students with disabilities. The purpose is to increase participation in student unions by universal design methods for accessible meetings, communication and social activities.

Accessible student unions

Accessibility includes equal right and opportunity for everyone to influence and participate in society and in higher education, regardless of functionality. Legislation on discrimination against persons with disabilities and student support at HEIs is essential but not enough. A central part of an accessible university also concerns values, norms, the questioning of prejudice and knowledge about disabilities. In 2012 the number of students applying for special support were 9 384, which is 3,3% of the total student population.

Disabilities included in the project:

- Movement, hearing and seeing disabilities
- Reading disabilities
- Allergies
- Psychosocial disabilities

As a means to change values and norms about who is able to be a successful student, The Swedish National Union of Students (SFS) has a project which aims to involve student unions to improve accessibility at HEIs throughout Sweden by increasing participation in student unions for students with disabilities. In order to do so, SFS has developed methods for accessible meetings, communication and social activities.

For accessible meetings the project has developed a ”tool box”. The ”tool box” is a guideline for how to hold an accessible meeting. Accessible communication has been an important part of the project. To encourage the student unions to implement accessible communication into their existing communication plan. The

most creative part of the project has been to develop accessible social activities. The student unions have for example discussed how to arrange an accessible dinner party and how to include everyone when planning entertainment, so that everyone can enjoy the show.

Part of the methods has been to develop ways to enhance knowledge about disabilities and to raise awareness of values and social norms within the student unions themselves. The idea has been to develop universal design methods to enable all students to participate in student unions' work and activities, but also to contribute to better and more welcoming organizations for everyone.

Examples on methods developed in the project:

- Accessible dinner party

- Accessible board meeting

- Accessible introduction for new students

In 2013 the project will publish a method book. The purpose of the book is to give tools to student unions on how to become more accessible and inclusive. SFS will offer support to the student unions during the implementation process.

Many of the student unions are willing to learn from the project and a majority of the student unions are participating in our workshops. More students with disabilities are starting to participate in the student unions activities, which is a sign of change and speeds up development even more.

Student unions

Students have the right to be represented in every board at a HEI in Sweden. Student unions therefore play an important role in making universities accessible by influencing decisions and questioning prevailing prejudices. By improving student unions' accessibility it will increase the opportunity for students with disabilities to influence their higher education studies. Through this project students with disabilities will be encouraged to apply to become student representatives in HEI boards. This will increase their influence on accessibility at Swedish HEIs.

It used to be mandatory for all students to be a member of a student union. In 2010 the mandatory membership was removed but the student unions still

represent all students. Because of the new situation the student unions focused on recruiting members and widening participation.

The Swedish National Union of Students (SFS)

The Swedish National Union of Students (SFS) was founded in 1921 and is the collective student voice in Sweden. SFS organizes 47 student unions at higher education institutions throughout Sweden. Together the student unions represent approximately 286 000 students and PhD-students. SFS' main task is to represent and promote the members' interests in higher education, research and student welfare issues at the national level. Through its participation in the European Students' Union (ESU) SFS also represents its members and Swedish students in the international arena.

SFS is organized according to democratic principles. SFS general assembly is the highest decision-making body where all the member unions are represented. SFS' general assembly is held each year and it is where the Chairperson, Vice-Chairperson and the board for the organization is elected. SFS also has a secretariat consisting of nine staff members to assist the elected representatives.

SFS is an active and strong voice in the education policy debate on issues concerning student safety, quality of education and influence. SFS is also a referral body and have a close collaboration with relevant authorities.

Mathematical Algorithms and their Modification for Blind Students

Lukas Masilko & Jiri Pecl (Masaryk University)

This paper could not be reproduced in this publication but can be found at-

http://www.teiresias.muni.cz/download/Mathematical_Algorithms_for_Blind_Students_paper.pdf

M-UDL - Developing Learning Objects for Virtual Learning Environments using the Principles of Universal Design for Learning (UDL)

Karl O Keefe (Enable Ireland) and John Gilligan (School of Computing, Dublin Institute of Technology)

Introduction

The aim of this work is to provide professionals involved in education and training with a set of reusable technological tools and techniques based on the Principles of Universal Design for Learning that will enable them to increase the reach, efficiency, effectiveness and accessibility of their training through online delivery.

Obviously accessibility is important when developing training materials in any field but it is absolutely essential that an Assistive Technology (AT) course follows best practice and in terms of education this means adhering closely to the principles of Universal Design for Learning (UDL) (CAST, 2011). Through an extensive literature review the intrinsic properties of AT that might influence its delivery as e-Learning were examined and previous AT education initiatives were reviewed. A case study into the NDA (National Disability Authority) (NDA 2012) approach to creating Universally Designed e-Learning was also carried out. Following this Moodle was then selected as the most suitable Learning Management System (LMS) because;

1. Features/Interactivity – Moodle is built on a social constructionist approach and facilitates interaction between course participants, between participants and instructors and allows differentiated learning. This pedagogical style and features have previously been highlighted as appropriate for delivering AT education.

2. Popularity/Reach – Moodle at the time of writing is powering 66, 356 registered sites in 215 countries and available in 75 languages. It has 1, 180, 564 registered users (Moodle.org, 2012).

3. Moodle is open source and therefore potentially less expensive to set up and operate.

4. Moodle compares favourably with other LMS in terms of accessibility both from the content author and consumer perspective (Kraus, 2011).

Background

Regular and up to date Assistive Technology (AT) training is acknowledged as being essential in maintaining a high quality AT service (Elsaesser & Bauer, 2011, Feyerer et al., 2002, Long & Perry, 2008, Mavrou, 2011, Verdonck, 2011). The rapid pace of innovation in the field coupled with greater public awareness and demand has resulted in increased pressure on professionals involved in the supply and support of solutions (KPT, 2006, Matausch et al., 2006). In 2002 the fledgling Enable Ireland Assistive Technology Training Service ran its first Certified Assistive Technology Training Course with the support of Microsoft and Dublin Institute of Technology. This 9 day course gave participants a broad introduction to all areas of Electronic Assistive Technology. The model behind the course was to enable all stakeholders involved in AT (AT users, friends, family and professionals) to come together, to learn about the latest developments in technology and service delivery, to use the equipment themselves and to learn from the people who use AT on a daily basis. They would then return to their places of work and be able to share what they had learned and put it into practice. This model worked then and is even more appropriate today and the course is still going strong with over 300 graduates to date.

There are a number of broadly accepted reasons why an organisation in any field might choose to make training available online or partially online rather than using traditional face to face methods. The four considered here are efficiency (in terms of time and cost for both those receiving and providing training), effectiveness, reach (scale) and accessibility. By making some training available as e-learning, two of the biggest barriers are removed; time and geography (Casimiro et al., 2009, Juntunen & Heikkinen, 2004, MacDonald et al., 2006) or, as has been put more eloquently, it allows "high temporal and regional flexibility" (Matausch et al, 2006).

Methodology

This work develops its learning objects using a version of the ADDIE model which has been augmented to include Universal Design for Learning. The ADDIE model was initially developed by Florida State University to explain the processes involved in the formulation of an instructional systems development (ISD)

program. (Branson et al, 1975). Most of the current instructional design models are variations of the ADDIE process (Piskurich, 2006).

An ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model was used to develop the initial pilot modules which were completed by 10 participants in the Spring of 2012. The evaluation of these pilot modules took the form of a detailed questionnaire issued to course participants and was supplemented by an examination of the user data captured by the LMS. In addition to this there was a further examination of the pilot modules against the UDL checkpoints.

This review showed that the pilot e-learning modules showed clear shortcomings and fell short of achieving the goals of UDL. UDL wasn't given enough consideration within the Analysis and Design phases, the majority of UDL considerations being implemented within the Development phase.

The second iteration of the process involved augmenting ADDIE with UDL considerations. The analysis and design phases needed to be improved and formalised and the principles of UDL needed to be embedded into throughout the entire development process.

To help embed UDL into the ADDIE process a reference chart to assist in the identification of tools and settings that will help Moodle satisfy the checkpoints of UDL was developed, Various forms, checkpoints and templates were developed, which can be used to guide the user through ADDIE in a way that embraces UDL at all stages. The MUDL chart, design form templates and accompanying handbook can be downloaded from the following link: http://www.electroat.com/UDLCharts/index.html. New learning objects were then developed using this augmented ADDIE model.

Outcomes and Conclusions

Using this augmented ADDIE process some Learning Objects in the area of AT training have been developed. These Learning Objects meet the objectives of UDL. The process has also been reviewed by AT trainers who are involved in developing online course materials. While having some reservations about possible long development times, the approach was welcomed. The resources provided a useful supporting toolkit to help embed UDL into the process of developing Accessible online learning objects.

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Persona-Based Teaching: A New Approach to Exploring the Dimensions of Universal Design using Personas and Scenarios

*Damian Gordon (*Dublin Institute of Technology(DIT))*, Antoinette Fennell (*National Council for the Blind of Ireland (NCBI))*, Ciarán O'Leary(DIT), Joshue O'Connor(NCBI)*

This paper explores the use of personas and scenario-based approaches as a means of explaining and exploring the concept of Universal Design for first year undergraduate students. To this end a collection of personas were developed and students were presented with these in various scenarios to consider in their designs.

The research was developed in the context of project being undertaken on behalf of Ireland's *Centre for Excellence in Universal Design* (CEUD). The CEUD is dedicated to the principle of universal access, enabling people in Ireland to participate in a society that takes account of human difference and to interact with their environment to the best of their ability. The goal of this particular project is focused on the development of a module centred on Universal Design for first year undergraduate students who are undertaking study in any disciplines that include an element of design, including, but not limited to, ICT, Product Design, and the Built Environment.

One of the keys challenges of the project is to explore ways to get students to consider designing for other people, because often they will tend to design exclusively for themselves; since they see themselves as being the norm, and don't recognise that by just designing for themselves, they create barriers and exclude others from their designs. Thus the goal is to inspire them to look beyond themselves as the norm, and to recognize that diversity is the norm.

One way of tackling this issue of self-centredness is to explore the use of personas. A persona is a fictional character that can be used to represent a collection of some of the kinds of people who could potentially be using a particular design. Typically in user-centred design the designers will use several personas to test the viability of a design. The personas allow the designers to consider the range of stakeholders that might be using their designs, and allows the designer to look at their designs from these stakeholders' perspectives.

The personas in this project were developed based around a family unit, called the Normal family (the family name can be semiotically interpreted as “diversity is normal”). The Normal family consist of six family members - a grandmother, a mother, a father, a 18-year old daughter, a 10-year old son in a wheelchair, and a baby.

The personas can be used to help the students in their own design work, and may be used to consider who are they excluding from their designs as well as who they are including. It is significant to note that there are situations where some of the personas may need to be deliberately excluded, for example, the baby persona should not be able to open medicine bottles, and using the personas can help the students consider these issues.

The personas where placed at the centre of the module and were featured in the majority of lecture notes, as well as in many of the in-class activities and take-home exercises. The students undertook activities wherein they role-played the diverse characters and reflected on the impact of design on such diversity. The students were also presented with the Normal family in various scenarios and used the family to explore how universal designed the world around them is, and in particular, the Normals were used as a mensurative instrument in conjunction with the Principles of Universal Design. Scenarios that the Normal family encounters included using an ATM machine, going to the bus stop, and visiting the airport, some of which were presented in video format, others in PowerPoint.

Students participating in this project reacted highly favourable to the use of personas, one student noted: *"The Normal family or persona method forces us to consider design from the perspectives of real people in the real world. It allows us to design with those specific personas in mind, and to be mindful of the different needs and wants of their individual demographics. The ability to extend the normal family with other people gives it an extensibility and flexibility not seen in a more idealized approach." Another said: "I found that the Normal family gave us all the information for the requirements that you might need … It also allowed us to investigate what worries or emotions might influence the average person, again based on their experiences or abilities."*

A small number of students felt that it was not their responsibility to take care of these kinds of issues, and that it is up to the guidelines, regulations, or legislation to sort these issues out. Although this perspective is perfectly valid, the universal

design approach recommends that if diversity is considered as a core part of the initial requirements of the design, the result will be a more innovative, flexible and usable design, which certainly proved to be the case in this project.

Some benefits of the personas approach included the assistance it gave the students working in groups; they were given a common, consistent understanding of the dimensions of diversity and were able to communicate and brainstorm more effectively about diversity to each other. It also allowed the students to focus on the users of their design and encouraged them to learn more about those users and understand how they will use the design.

However the key benefit of using personas is that it made the need for "diversity as the norm" a concrete requirement; instead of having to instruct the students with advice such as "*make sure you consider diversity in your design*" it was possible to say "*make sure each of the Normal family can use your design*" in other words it put a human face on abstract requirements which appealed and resonated with a great majority of students.

Talking Books and Accessible Literature for Students – A Library Integrated Approach

Maria Björklund (Lund University), Anna Mia Eborn (Karolinska Institutet University)

What can universal design in the university library be? Can all textbooks be accessible?
Our presentation gives examples from two Swedish university libraries (Karolinska Institutet, Stockholm, and Medical Faculty Library at Lund University) on how textbooks can be made accessible to students. Legal frameworks, technological development and increased awareness of disabled students' rights have made this possible.

Swedish university libraries give students with reading disabilities access to talking books and other accessible formats of literature. The libraries give the talking books service integrated with other services the students may need in line with the "one-stop shop principle", meaning the students get all course material in one place.

The Swedish Library Act and the Swedish Benefit Assistance Act states that special attention should be paid to disabled persons' needs. A rapid technological development in recent years has led to a national infrastructure for downloadable talking books to meet the needs of disabled persons. An exception in the Swedish copyright law makes it possible to provide talking books, generated from printed books, via Swedish Agency for Accessible Media. Swedish legislation on students' equal rights and university policies constitutes a framework for the library service in making literature accessible for all students.

The most common disability among students in Sweden is dyslexia, and many students express that talking books can help them compensate and makes it possible to study on the same conditions as other students. Most textbooks in higher education are available as talking books, and if not, a new production can be ordered by the local library. In practice, the library gives the student access to Swedish Agency for Accessible Media's national archive, and the student can download the talking books to his or her own computer. Talking books are in DAISY format, containing mp3 files, and newly produced talking books may also contain the entire text from the printed book which many students find useful.

The threshold for the student to get access to the archive of talking books is very low. The librarian creates an account for the student upon request- no certificate is required. This is the same for the public libraries. In this way the service can help a wider range of students and people in general with learning disabilities without going through the coordinator for students or the health care system. The additional services to order a production of a new talking book or free downloading of reading programs requires a certificate since the cost of this is fairly high.

There are many different options in how to listen to talking books; a reading program on the computer, a music device or a smartphone can be used. The different options are useful to many students depending on the students' preferred study technique. The librarians also help the student to get other material than textbooks in an accessible format. Software, like text-to-speech, is available and integrated in the study environment in the libraries and after some instruction many students starts using it to listen to texts, or produce audio files of material they need.

Finding an individual solution that works for every unique student is a key to successful studies. To really see the student's individual needs and wishes is important and the student is the one who can tell if a solution has the right qualities needed. The variety of tools guarantees that all text material can be transformed to audio material. It also makes it possible for the student to try different study techniques with text in combination with audio material. It is crucial to help the student to feel comfortable with the technology and to get started, to make the technology a help and not another obstacle. Communication and follow-up is equally important, and we encourage the student to get back in touch with the library if he or she has any questions.

Our experience of the library integrated "one-stop shop" for disabled students to get accessible literature is that the model makes it easier for students to get all the literature they need in one place. We are happy to see so many students benefit from the solutions available in the library integrated service. The librarians' serves as facilitators or instructors for students on their way to a successful education. Our conclusion is that the technical infrastructure and solutions, i.e. downloadable talking books, mobile apps and text to speech software, contribute to make students independent.

The Hybrid Book – Universal Access to the Content

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Short abstract

Hybrid Book provides a universal access to the content for users with various disabilities as well as for users without disabilities and it is based on synchronization of various types of components of audio, video and text media.

History

Hybrid Book is a document format which was created at Masaryk University and has been used to publish digital documents at the University since 2002. It was originally a digital text **synchronized** with an audio recording and navigable through its hierarchical structure, primarily intended for students/users with visual impairments. Over the last ten years, the Hybrid Book has developed into a mature document format enabling an undistorted access to information to students and other users with various disabilities (visual or hearing impairment, learning disabilities etc.) as well as users without disabilities find this document format advantageous for its multi-modality.

Introduction and the Latest Development

The original text/audio data setup has been **extended to the triad text/video/audio** and the main aim of the designed data structure is to synchronize thus distinguished types of records and it allows one to include multiple media (text, video, audio).

The extension of the data setup with video component has been made primarily in order to add a translation of the document into **sign language** (besides the mentioned audio recording) to enable access of the content to deaf using sign language. But it is obvious that it offers further applications – the hybrid document is a convenient format to save and publish **recordings of live events** (such as lectures, presentations etc.) as a synchronized compilation of audio and video record of the event together with text transcript of the speeches of the event. As the primary application of the Hybrid Book is publishing scientific documents, the system has to provide several advanced features considering complexity of access to such content.

Currently, the development of those features mainly concerns:

- extended navigation in tabular data which supports screen-reader users and considering sign language translation of those data
- inclusion of symbolic structures (e.g. math formulae) and flow diagrams
- tool to handle user's commentaries

Characteristics of the Format

The descriptive structure is designed so that it allows synchronization of records of various types based on "synchronization points" only, i.e. if it is possible to describe a given record with a succession of points (e.g., timestamps in an AV recording), it is then also possible to add this record to a Hybrid Book document. It is also possible to add static data (such as images and graphs) in the form of links.

Individual records are bound in the Hybrid Book by an external description. Records as such are not altered. Thus, it is possible to add content to the document from any storage. Any type of record may be added mostly without a need of any special modification. A record or document which is being added must have the above mentioned properties: synchronization points must be applicable to the record/document. The HTML format may serve as an example. It is used in the Hybrid Book for storing text – for example, attributes such as ID or NAME may be used to mark individual synchronization points.

There are two ways to navigate in the Hybrid Book:

1- "linear" navigation, i.e. moving forward/backward by individual synchronization points;

2- "structured" navigation, i.e. by the hierarchical (tree) structure of the document.

It depends on the equipment of a particular browser which navigation steps will be at the user's disposal; most often, navigation by adjacent synchronization points and by chapter titles is used.

Reading the Hybrid Book

It is obvious that individual types of records of the document content (text, video, audio) are equal and each of them represents an information channel. It is

nevertheless possible to freely switch between those records or follow them simultaneously and thus take advantage of further characteristics of such arrangement: to comprise the final form of information from multiple sources (so called “hybrid reading”) and as such it provides a universal access to the content.

It was the original aim of the Hybrid Book to provide this way of access to information; and to avoid creating documents aimed directly at a particular user with all his/her needs and

requirements; we are creating a virtual document described by a physical structure which enables the reader to choose his/her own access to it and the method of receiving offered information. For this goal, it is naturally necessary to provide users with platforms to read Hybrid Book

References:

1/ **Hybrid Book Reader as a web application**
(http://www.teiresias.muni.cz/hybridbook)

The first tool implemented to browse hybrid documents providing all features described above and its functionality is continuously expanded.

2/ **Hybrid Book Reader as applications for mobile devices**

To enable access to document content “everywhere”, we consider implementing the Hybrid Book Reader in versions for mobile devices as an outlook for the further development.

Towards an Inclusive Architectural Education

Sandra Manley, Ann de Graft-Johnson and Katie Lucking, University of the West of England, Bristol

Architecture is a profession where representation of disabled people is essential if the aim of achieving truly inclusive environments is to be realised.

> *Put simply, disabled people are best placed to know what they need from their environment and they should therefore be involved at both policy formulation and project development levels* (Goodall, 2010)

However, disabled people are underrepresented in the professions, such as architecture, that shape the built environment. The negative impacts of the built environment on the opportunities open to disabled people to participate fully in mainstream community life have long been recognised (Goldsmith, 1963, Imrie and Hall, 2001, Commission for Architecture and the Built Environment (CABE), 2006, Burton and Mitchell, 2006, Manley, 2010). The promotion of a set of principles for ensuring that the built environment meets the needs of all users, including disabled people, has been promoted for some years on the basis that making the environment work well for disabled people must have the effect of making life easier for many other groups. In the USA and in other parts of the world this is termed universal design (Ostroff, 2001, Ostroff and Smith). Although in the UK the preferred term is inclusive design, the aims and general approach have much in common and are defined by Omerod and Newton (2006) as:

> *a way of designing products and environments so that they are usable and appealing to everyone regardless of age, ability or circumstance, by working with users to remove barriers in the social, technical, political and economic processes underpinning buildings and design.*

Commentators (De Cauwer et al, 2009, Ostroff, 2010) have raised the issue that there appears to be some resistance to teaching inclusive design in schools of architecture. Whilst the employment of disabled people in the built environment profession by no means guarantees that inclusive design principles will be more widely accepted in the profession, there is a perception that disabled architects are more likely to consider these matters as a central tenet of the design process rather than as simply the minimum requirement to meet regulatory codes or as an adjunct (Manley et al, 2011).

With this in mind Architects for Change, the RIBA's equalities forum, prompted a research project at the University of the West of England, Bristol (Manley et al, 2011). The aim was to examine the experiences of disabled people in architectural education and practice, identify impediments to the inclusion of disabled people in the profession and make recommendations to remove obstacles and potentially create a more inclusive discipline. Whilst the research looked at both education and practice, the majority of contributors were more concerned about their experience in the educational context. Architecture is, of course, just one of many subjects studied by disabled people at university and some findings are specific to this subject. However most have general applicability across the sector so the findings do have a wider relevance across disciplines in higher education.

The research, completed in 2010, but as yet unpublished by the RIBA, involved online questionnaires, completed by 88 people and 11 interviews with disabled architects and architecture students as well as a review of 18 websites of schools of architecture.

The Research Findings

It was evident that the majority of respondents to both the questionnaire and in depth interviews (62%) were actively discouraged from entering a career in architecture. Architecture was not seen as a suitable career for a disabled person by parents, teachers, and careers officers. The implications of this for educators are that university outreach programmes required by Access Agreements need to challenge and help change this perception. Website analysis revealed that few institutions gave any indication that disabled students would be able to study architecture successfully.

Support for disabled students on architecture courses was of variable quality. Many students confirmed that they had experienced problems in obtaining adequate information prior to entry on matters such as whether the site and studios were accessible, the availability of appropriate hardware and software and whether reasonable adjustments would be made to facilitate learning. Furthermore the time lapse between the identification of an individual's needs for support and the point of receiving support once a student had embarked on a course, was often too long. A hearing impaired respondent, who had completed a degree course, despite making positive statements about the attitudes of support staff, commented that:

The final year of my studies provided me with the support I needed, it's a shame the process wasn't quicker so I could have benefitted during the second and third years".

Perhaps the group that raised the most concerns were students with mental health impairments. Effective liaison between academic and support staff and the student was often absent and some academic staff, perhaps unaware of what was appropriate or legal, expressed blatantly discriminatory attitudes towards students. A number of students commented that a lack of understanding on the part of support staff of the requirements of an architecture course had resulted in inappropriate provision. The prevailing tendency to work long hours, including all night sessions to meet deadlines, was criticised by many students as a macho culture that disregarded people's well-being.

It was evident from almost all comments from student participants that inclusive design was viewed as a technical or statutory requirement that potentially had a negative impact on design quality and aesthetics. Some students felt this in itself was exclusionary, because it effectively denied the existence or importance of disabled people as significant users of buildings. These exclusive attitudes in the educational environment may have the effect of perpetuating the failure of architects to develop an understanding of inclusive best practice.

In examining the experiences of disabled people in both architectural education and practice, the overall conclusion is that architectural education requires significant changes. The education sector acts as a gatekeeper to the profession and it has been too effective in excluding rather than including disabled people. Even before entry to architecture school, many disabled people are given strong messages that architecture requires major sacrifices and hardships and is not a profession suitable for people with impairments. It also seems that too often disabled people who survive their education perceived their time at architectural school as a grueling struggle rather than as a time of exciting creativity. On the contrary the paid workplace was viewed as providing more positive experiences. Schools need to create inclusive cultures and deliver architectural education that recognises the need for inclusive design. Without this the built environment will continue to be exclusive. Creating a more diverse profession that reflects the population that it serves is likely to have all round benefits to the design of the built environment.

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Trinity Inclusive Library Strategy: Working for an Inclusive library environment

Declan Treanor, Director of Trinity College Dublin Disability Service

https://www.tcd.ie/CAPSL/TIC/projects/inclusive-libraries/index.php

Introduction

The Trinity Inclusive Library (TIL) strategy was set up in Trinity College Library Dublin to embed inclusion within the mainstream practices of the Library. The strategy was established, following an external quality(library) review that highlighted the need for supports for disabled readers to be embedded into mainstream service provision within the library. This paper describes the activities and outcomes of the TIL strategy, highlighting its successes in inclusive service provision.

Background

Over the past decade, the numbers of students registered with the Disability Service in Trinity College Dublin (TCD) has increase significantly from 222 in 2001-02 to 1100 in 2012-13. Students with disabilities have many diverse needs as users of the Trinity College Library Dublin and so an external quality review to provide an evaluation of the library based supports for readers with disabilities was organised for August 2009. The review found that the main challenge facing the Library was to find a mechanism that would ensure a clear, sustainable and flexible strategy for inclusive practice as provision of services for readers with disabilities.

Funding was sourced to allow for the recruitment of a staff member to implement the key recommendations of the review. This person worked with an oversight committee including representatives from the Library and from the Disability Service to progress on recommendations arising from the review.

What is Inclusive Practice

Inclusion is achieved by following the principles of universal design. Universal design is a 'common sense approach to making everything we design and produce usable by everyone to the greatest extent possible' (Institute for Human Centred Design, 2011). Universal design moves beyond accessibility for disabled users to recognise and respond to the great diversity of the human population, and the

diverse ways through which buildings, services, or products are accessed and utilised. In 1997, Connell et al published the seven principles of universal design for the production of physical objects, and in 2001 Shaw, Scott and McGuire adapted them for use in education and added two further principles specific to the learning environment: that learning takes place in a variety of settings, and that there is a clearly conveyed openness to meeting the diverse needs of learners.

Principles of Universal Design (examples adapted for an academic library setting):

1. **Equitable use -** Library does not disadvantage any group of readers. Example: Using web-based resources so all readers can access materials, regardless of distance from campus, etc.
2. **Flexibility in use** - Library accommodates a wide range of individual preferences and abilities. Example: Using varied training resources to support different ways of learning (workshops, audio-visual resources, web-based resources).
3. **Simple and intuitive** - Library services and facilities are easy to understand, regardless of the reader's experience, knowledge, language skills, or current concentration level. Example: Clear library maps and information on resources and lending.
4. **Perceptible information** - Library services designed so that necessary information is communicated effectively, regardless of ambient conditions or the reader's sensory abilities. Example: Offering assistive technologies and ensuring texts can be accessed by readers using those technologies (e.g., screen reader, text enlarger).
5. **Tolerance for error** - The design minimizes hazards and the adverse consequences of accidental or unintended actions. Example: Email warning regarding overdue books.
6. **Low physical effort** - Library can be used efficiently and comfortably, and with a minimum of fatigue. Example: Similar subjects housed near each other to minimise reader journeys to collect relevant resources
7. **Size and space for approach and use** - Appropriate size and space is provided for approach, reach, manipulation, and use, regardless of the user's body size, posture, or mobility. Example: Comfortable and spacious work spaces
8. **A community of learners** -The environment promotes interaction and communication among readers and between readers and librarians. Example:

Group study spaces, a librarian clearly available to respond to queries from readers, use of online forums for communication.

9. **Instructional climate** - Library is designed to be welcoming and inclusive. Example: Creating a statement affirming respect for diversity, encourage readers to discuss any special learning needs with the library either directly or via the Disability Service.

Aims and Objectives of TIL

TIL aimed to embed inclusion to to create an inclusive, barrier free library environment where the diverse population of TCD could access all resources, whether printed or electronic in a comfortable, accessible physical environment.

Common difficulties faced by readers with disabilities included:

- An inaccessible physical environment,
- Inaccessible materials,
- Side effects of illnesses and of medication,
- Difficulties with self-management,
- Communication difficulties,
- Inaccessible training events.

Considering the difficulties the following objectives were set for the TIL strategy:

- Physical Environment: To improve physical access for all library users,
- Information resources: To enhance access to informational resources and to agree a model for provision of information in alternative format,
- Staff training: To develop an inclusivity awareness programme to be embedded into staff training,
- Library Policy: To develop a clear service policy, coordinated between the Library and the College Disability Service, to enhance inclusion.

Activities of TIL

Physical Environment

The Trinity College Library includes an extensive array of buildings, dating from the eighteenth to the twenty first century. As per the Irish Disability Act 2005, these buildings should be accessible by 2015. While most of the libraries

resources are housed in more modern, accessible, buildings, accessibility issues can still arise. Recent building projects have accommodated the principles of Universal Access, and the Disability Service and the Library work together to identify and respond to accessibility issues in existing buildings, which are then made accessible through retro-fitting. Improvements to physical accessibility during the TIL strategy included the installation of new automatic doors, visual alarms and loop systems, and the development of ATIC spaces.

ATIC Spaces

The Trinity College Library houses three modern resource rooms called "Assistive Technology Information Centres"(or ATIC) in the three main library complexes. These rooms include computers with assistive software, low distraction study spaces, and other assistive technologies. As part of the TIL strategy these resources were refurbished and expanded. More information on these services can be found at http://www.tcd.ie/disability/services/AT/Where-AT.php.

Information Resources

The TIL strategy sought to ensure that all users of the library had access to all library resources, whether in print or electronic format. Access barriers may involve inaccessible formats, inaccessible content, or difficulties physically accessing resources.

Accessible Information Policy:

Trinity College Dublin adopted a College Accessible Information Policy in 2009 that set out a formal commitment that information would be available in an accessible format, without discrimination against those with print disabilities. The TIL strategy supported the Library as it worked to implement this policy, and organised workshops for library staff on developing Accessible Information strategies. Accessible Information policy is linked here: www.tcd.ie/about/policies/accessible-info-policy.php

The Library Website

Prior to the TIL strategy the library website had a page with information for disabled readers. This page was rewritten to update information on services and to enhance clarity, ensuring that the content is more user friendly. Web resources were also developed for library staff, and a companion page on readers with disabilities was compiled for the Library staff intranet. Furthermore, a series of

webpages on inclusion in the library was added to the Trinity Inclusive Curriculum website (www.tcd.ie/capsl/tic/projects/inclusive-libraries/index.php).

Prior to the TIL strategy the reader website also included a small number of audio-visual clips. Over the course of the strategy, additional clips were filmed including updated clips on using library facilities, Endnote web and good practice regarding reading lists. There is funding to develop further resources.

Reader Training Opportunities

Library tours and training sessions are an important learning resource for library users. Therefore, training events and library tours were evaluated as part of the TIL strategy. A series of good practice recommendations based on this experience were then collated. These recommendations highlight good practices that enhance the ability of all readers to access the format and the content of training offered and is available at http://www.tcd.ie/CAPSL/TIC/projects/inclusive-libraries/training.php.

Alternative Format:

Readers with print disabilities have difficulty in reading the written word as presented in a conventional way, such as hard copy books and documents. Therefore, they require an 'alternative format' or alternative mode of access to this material. Alternative formats can include electronic access via a screen reader, audio access and large print.

To date, all alternative formatting in TCD has been done on an ad hoc basis. The TIL strategy sought to clarify an alternative formatting process and so drafted an alternative formatting process flow chart that will be piloted over the coming academic year. The strategy is also working to develop a repository of alternatively formatted resources for efficient retrieval in future.

However, even with an agreed process, there are still many obstacles to the effective provision of alternatively formatted resources. These include the late receipt of reading lists, which delays the process; difficulties acquiring machine intermediate electronic versions for editing, which can be down to a lack of awareness of alternative formatting needs amongst publishers; and difficulties finding time and monetary resources to alternatively format from physical copies.

Following discussion it was agreed to work to raise awareness of the importance of timely reading list provision. A series of good practice reading list guidelines were collated and circulated to all academic staff in Trinity College and AV clips highlighting these practices were developed. These strategies had limited success in increasing the reading lists submitted to the library and so it was agreed that library access to the online learning platform would be sought as this would allow subject librarians to view reading lists or materials suggested within lecture presentations.

The TIL strategy collated an Alternative Formatting report that highlighted difficulties with alternative format provision and offered recommendations for future practice. The report was brought to a meeting of library representatives from higher education, and it was agreed attempt to engage directly with publishers as the alternative formatting process would run considerably smoother if libraries could work closely with publishers to obtain electronic versions of resources.

In 2011 a Copyright Review Committee was established to examine the current Irish Copyright legislation. The committee engaged in a consultation process where interested parties were invited to submit their views for inclusion in the review. The TIL strategy engaged in this process, and recommended that:

- Publishers are given an anticipatory duty to retain intermediate electronic versions of resources that can be supplied in a timely manner when requested for the purpose of creating an accessible resource for a person with a disability who is the owner or lawful user of a work.
- The intermediate electronic documents follow an agreed standard to ensure accessibility.

Submission for the Copyright Review linked at:
http://www.tcd.ie/disability/banner/Links/Conf-papers.php

Staff Training

A series of annual training sessions were agreed to ensure all library personnel understand the steps taken to ensure an accessible, inclusive library environment and are confident dealing with requests and queries from disabled readers.

Training sessions include an annual workshop on Accessible Information, which offers attendees advice on how to use everyday packages such as Microsoft Office

and Adobe Acrobat to create accessible information, and a presentation entitled 'Disability Supports within the Library', which updates staff on library based supports for disabled readers, offers a tour of the ATIC rooms, and responds to any questions regarding disability provision.

An online self-evaluation for librarians was also developed as part of the TIL strategy. This tool follows a tick box format, with questions designed to trigger reflection on inclusivity within everyday tasks. The tool is available for use by library staff both within and external to TCD from www.tictool.ie.

Library Policy

The TIL strategy ran for eighteen months but sought to future proof the progress it made through embedding into policies and processes that would run beyond its completion date. At the beginning of the TIL strategy it was decided to update the current Library Reader charter to ensure inclusion was embedded into it.

Following approval of the charter, the TIL strategy begun work on an inclusive code of practice and guidelines document. This document was compiled with input from the Disability Service and the Library and covers:

- Physical Environment,
- Library Resources and IT,
- Library Facilities and services,
- Library organised training and events.

This document will be used as a reference by both services into the future and will be updated annually in consultation from both areas. A monitoring committee has been established with representatives of both service areas, and this committee will oversee the implementation and annual review of the Inclusive Code of Practice and Guidelines.

Current Position and Future Plans

TIL has had many successes to date, enhancing the accessibility of library resources and facilities, introducing training and awareness raising measures and implementing a new library charter and Code of Practice.

However, the strategy needs to ensure that progress to date is not lost, and that inclusion and reader needs are monitored and updated. Training will need to

continue on an annual basis as new staff are recruited to the library, and as processes between the Disability Service and the Library evolve and change. Furthermore, the Code of Practice will need to be updated annually and a TIL Monitoring Committee with representatives from the Disability Service and the Library will be established for this purpose.

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Additional resources

https://www.tcd.ie/CAPSL/TIC/projects/inclusive-libraries/index.php

Undergraduate Students Learning of Universal Design through Community Engagement with Enable Ireland

Bernard Timmins (Dublin Institute of Technology), Siobhan Long (Enable Ireland)

DIT's Product Design programme, Enable Ireland, and people with disabilities in the community have teamed together to create a unique Assistive Technology and Universal Design learning environment, significantly supported and resourced by the entire team. In this environment students realise very quickly that using 'off-the-shelf' generic Assistive Technology devices for people with varying degrees of disability can lead to Assistive Technology abandonment, and that their innovative designs can play a key role in addressing this issue.

Having used and discussed AT devices with Enable Ireland staff, students are then able to talk to AT users and hear their views of AT design. Ultimately this shared understanding of the interaction between user involvement and the generation of innovative design concepts, together with the enthusiasm of both the students and AT users have carved a successful path; resulting in a total external (public & private) funding of 71k and DIT funding of €20k to date.

Successful PhD/MSC research projects, media coverage, and an increase in community, international 3rd level, and private company involvement has created a dynamic partnership that fosters the notion in budding designers/engineers that participative, inclusive design makes good business sense. But more importantly this process gives practical personal evidence that engaging in the community is a mutually rewarding experience. Positive community engagement in Ireland can have far reaching consequences and raise awareness of the need for Universal Design.

Community Feedback Driving Design

A reoccurring theme from the community is: why aren't these innovative designs being made? Reacting to this Enable Ireland, in partnership with Dublin Institute of Technology launched a Community Design Challenge in Microsoft on Monday, December 3rd 2012. This competition is open to all students nationally and internationally, and is sponsored by Leckey, a company which specialises in designing and manufacturing specialist seating and postural management devices for children with disabilities. This competition will close in June 2013, when a winner will be chosen with a view to getting this design to commercialisation.

AT Users participating in Universal Design

User input in the development and design of technologies which enhance independent living opportunities for individuals with disabilities have been, to date, limited. Enable Ireland and Dublin Institute of Technology have spearheaded a number of initiatives to address this gap, with a view to enhancing both product choice and user experience of engagement in the design process. A doctoral research project, using the Delphi, and Participative Design study methodology, has focused on the development of an alternative computer input device in partnership with experienced adult AT users. This preferred approach, using the Participative Design Delphi model, has ensured that end users with disabilities have engaged actively in the research process, with the researcher closing the feedback loop by integrating workshop outcomes in each iteration of the design process. A parallel strategy to promote user engagement has seen the establishment of a Community Design Challenge and associated blog: www.userdrivendesign.org. Although still in its early phase of development, the latter has contributed to a growth in engagement between users, designers, service providers and manufacturers. Reported satisfaction ratings from users have been positive, with a resultant empowerment of users leading to a rise in expectations both of technology itself, and of individuals' personal goal-setting. A foundation stone of this collaborative work has been a willingness among all partners to place trust in the process, without knowing what the outcome might be.

Student Experience:

As a result, successive groups of students are encouraged by their outgoing final year peers towards positively interacting with this module, and to date no negative feedback or resistance has been encountered. Conversely students (with little or no experience with dealing with clients with disability) look forward to meeting clients, interact extremely well with clients, and develop good working relationships. Clients report favourably on students, and enjoy the special attention that the project confers upon them.

During student evaluations, one key question is “how much has this experience changed your perceptions of design?”, and on average the class response is that their perception of design has changed by 83%. In an incredible journey from theory to practice, through engagement with clients, students learn about

responsive design. Students like having user feedback, rather than relying solely on their academic advisors. Students enjoy the visit to industry to see the facilities first hand and like meeting staff directly involved with using designs in practice. Overall students prefer the real world experience, rather than learning design simply from textbooks and/or classroom experiences.

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Universal Access in University College Dublin: A Work in Progress

Tina Lowe, University College Dublin

My name is Tina Lowe. I have worked in UCD since 2008, initially as the Disability Officer and now as the Campus Accessibility Officer. I am a graduate of UCD, having attended as a mature student, from 1997 to 2002 after acquiring a disability that resulted in losing my sight in 1993.

My role as Campus Accessibility Officer is primarily to play a leadership role in the development and implementation of policies and initiatives to meet the requirements of the Disability Act 2005 and thereby facilitate people (including students, staff and visitors) with a disability to access the university's services and facilities.

Making our environment universally accessible is critical to full participation in life, to my work and for my guidedog. I have come to realise that if our environment is unnecessarily difficult to navigate that it not only affects people with disabilities but it impinges on the lives of our entire population. Universal access works for everyone and it makes good business sense.

I believe that universal access will, in time, become a natural part of the fabric of our society and our culture and as it is adopted in product design, buildings, and ICT it will be accepted as a naturally inherent part of any design. However, until now we have not looked at the overall design of our buildings and services to include our entire population so we now need to re-examine how we approach our thinking on inclusivity. We need to see it as a positive step and a far reaching, more competitive and economically sound way of engaging with our educational settings.

My paper looks at what we have done to date in UCD, as the title indicates it is a work in progress, we are on a long road to changing the mindsets of all involved and we realise that our task will involve a step by step approach.

Public bodies, by law, must ensure that people with disabilities can use their buildings and services easily, and at the same location or access point as everyone else.

As part of my role as Campus Accessibility Officer there are a number of key areas that must be addressed by UCD, including:

- The Promotion of an Equal Status Policy
- A Universal Access and Design element to the University's Charter
- Ensure that accessibility is built into procurement for all goods and services
- Enable information to be provided in accessible alternate formats
- Ensure that people with disabilities (including staff, students and visitors to the University) are continuously consulted and engaged in all accessibility issues
- Provide on-going disability equality training for staff and students
- Engage with senior management and get their buy in.

Historically, UCD is made up of a diverse physical environment on a 350 acre campus, comprising 18th century listed buildings; 21st century buildings; with the main campus built in the 60's when accessibility was not on the agenda. Inclusive teaching practices were not an issue and so universal access and design in UCD is still a relatively new concept.

In order to create a universally accessible educational environment we must provide an accessible built environment. The links between buildings from approach to the entrance must be established, in order to avoid difficulties in navigation. Surfaces and signage must be inherent in the accessible design if we are to have ease of movement between buildings and within the buildings themselves.

As we achieve an accessible built campus, by implementing the legislative requirements of the Disability Act 2005, the building control regulations, and the equality legislation, we can then also address how to provide accessible information.

Accessible Information can be provided in different ways, both technologically and by establishing inclusive teaching and learning practices. There are many technological advances which provide fora for implementing alternative teaching practices. Accessible information must adhere to guidelines and must be part of any organisation's procurement practices.

We all know, without being told, that education has endless possibilities for all of its participants and is one of the important keys to enabling people who have

disabilities. Accessibility can pose complex issues in the case of people with disabilities for there is a stream of attitudes, practices, presumptions, rules and structures which make the barriers from disability to education, including third level education appear to be, on occasion, insurmountable. People with disabilities have to negotiate and navigate each apparent barrier step by step.

Barriers to accessibility can be both tangible and attitudinal. An organisation has to fully embrace the desire to transform its sometimes inherent discriminatory attitudes towards people with disabilities by creating an inclusive educational setting. Physical infrastructure can be a barrier by its poor design but it is much easier to change the physical environs if the attitudinal barriers are addressed. The way to change attitudes is to take a direct approach to the issue of ensuring accessible practices are part of the organisation. Direct advocacy can be permeated from the top if the management see making the third level institution a showcase for access, and see it as an opportunity to create an environment which is more competitive and more enterprising. The legislative context requires that the third level institution must make the environs accessible but buy in from the top is essential to initiate this change.

The reality at present in UCD is that due to its historical background there are many different buildings, many different infrastructures, services included in one setting. The practicalities of changing this physical environment are a slow process. We have begun this by recently carrying out an accessibility audit of ten prioritised buildings, which were chosen due to their footfall, location on the campus and historical age. The accessibility audit is one strand of the Disability Access Plan for the campus.

In addition to addressing the accessibility issues for the buildings, teaching and learning practices and ICT accessibility must also be included in creating universal accessibility.

In order to take on this aspect of the Disability Act's requirements in UCD, several strategic steps have been set in place. A Widening Participation group has been established with different strands addressing each area of the accessibility requirements of the Act. Teaching and Learning practices and implementation of training modules are part of this plan. ICT are now looking at auditing their current systems on the campus, reviewing how accessible their software packages

and physical labs are. The plan is to audit the main systems used by the students and staff and visitors to the campus to make these specific systems accessible.

As you can see universal access in UCD is in developmental stages and is an ongoing work in progress.

Universal Design for Learning in Higher Education: How to Implement?

Meggie Verstichele & Katrien De Munck, Support Centre for Inclusive Higher Education, SIHO

With the Support Centre for Inclusive Higher Education (SIHO), we assist every institution for higher education in Flanders (Belgium) to work towards 'inclusive higher education'. One of the frameworks we address to, is Universal Design for Learning (UDL). This theoretical and scientific framework of UDL is based on three main principles: providing multiple means of representation, multiple means of action and expression and multiple means of engagement. The main issue of UDL is that every learner is different and that staff therefore needs to be flexible in the way they teach and shape lessons and evaluations.

UDL is the answer to realize inclusion in higher education, since diversity in the group of students is guaranteed, but not always known. UDL offers a proactive way of creating a learning environment that meets the needs of all learners.

Within SIHO we got inspired by the work of CAST (www.cast.org) and we inspired the Flemish higher education by giving information in many different ways and occasions. A step further in implementing UDL in a sustainable way, was to coach faculty.

Every academic year we coach groups of teaching staff to work with the framework of UDL. In a series of 4 hands-on workshops, we introduce them to the theory and apply it to the design of their curriculum. We start from an aspect which they are proud of in their teaching and recognize how this is an example of UDL. Later they choose one 'difficult thing', something they want to work on.

In the next coaching session, some weeks or months later, we give again some theory on course material and staff members can bring their own course material. We look at barriers within the course material and give advice and concrete tips.

In the third session, the participants work on a computer and try-out ICT-tools to help with the 'problem' they were articulating earlier on. In the last session, we focus on how you can be flexible in the way you evaluate students.

The coaching sessions use creative, brainstorm- and sharing techniques and bring people together from different educational contexts, which multiplies the exchange and sharing of good practice.

All this teaching staff spread to their own departments and institutions and influence their colleagues at teaching and policy level.

Next to the coaching we train people in workshops, training days and through online material. We provide tailor-made training too. Through a website www.siho.be/udl, we connected ICT-tools with the UDL-principles. To design your education in an accessible way, you find a source of ICT-tools. Or in the other way around, you can look for tools that allow you to make a presentation, to give overview, to create visuals and you learn how that tool helps you install an accessible learning environment.

The concept of UDL is appealing to us and to the Flemish context of higher education. All our material is available open source, everybody can participate for free. We enjoyed the process of organizing our work on UDL in a UDL-way to appeal to the creativity that exists in higher education and use it to its full potential.

UDL is not meant to minimize the goals or expectations towards students. By designing higher education, accessible for all, we will be able to provide qualitative education, with high goals and expectations. UDL is not a magic trick or one prescribed formula. It's a way to work proactively to reach all students. It offers tools to reflect about our way of teaching.

Universal Design of the Built Environment – How Dublin Institute of Technology is ensuring the built environment is accessible for all.

Eoin O'Herlihy, Managing Director, O'Herlihy Access Consultancy, www.accessconsultancy.ie.
Paul Mc Dunphy, Buildings Officer, Dublin Institute of Technology, www.dit.ie/buildingsoffice/.

Background to Dublin Institute of Technology

Dublin Institute of Technology (DIT) is of one of Ireland's largest Third Level Institutions catering for over 20,000 students and 2000 staff accommodated in over 35 separate buildings. With a history stretching back over one hundred and twenty years, Dublin Institute of Technology has been recognised as a pioneer in technological higher education.

The formal creation of DIT itself in 1992 brought together six colleges recognised as centres of excellence in their areas of specialism and following the establishment of the Institute, their expertise formed the nucleus of the current faculty structure within DIT. The Institute is the largest third level educational institute in the country with an estates portfolio which includes 125,400 sqm. of floor space accommodated over 35 separate buildings, and located right in the heart of Dublin City.

DIT is now poised to consolidate its position in Dublin's inner city, bringing its entire community of students and staff from sites across the city together in one central location at Grangegorman. The Grangegorman campus will amalgamate all existing academic activities and offer a range of new facilities, including sporting and recreational amenities, performance and exhibition space, industry incubation and innovation space, and significant student residential accommodation.

Commitment to providing an innovative, responsive and caring learning environment and meeting accessibility/Universal Design legislation

The Institute is committed to providing an innovative, responsive and caring learning environment for a diverse range and level of programmes to students of all ages, sizes, backgrounds and abilities.

DIT is aware of its legal requirements to ensure the services they provide are accessible and has recognised that the built environment is one of many elements to make services accessible. The Institute is aware that the following legislation must be considered to make its services and buildings accessible to all people regardless of their age, size or disability:

- The Equal Status Act 2000-2011.
- The Disability Act 2005.
- The Building Control Act 1990-2007.
- The Safety, Health and Welfare at Work Act 2005.

Project Overview

In 2012, the Buildings Office recognised the importance of developing a three year Access Policy and Action Plan to demonstrate their commitment to making the built environment accessible and usable by all people regardless of age, size or disability.

With this in mind DIT Building's Office identified that the first step would be to carry out a high level accessibility service review of the built environment. This would identify how DITs built environment accessibility can be improved to make the DIT Facilities and campus's more enjoyable and safer for everyone to use. The review focused on a number of areas including:

- General procedures in place (e.g. access team, staff training, dedicated point of contact).
- New works (e.g. considering access through all stages of a design and build project and ensuring the latest best practice standards are utilised).

- Existing buildings/sites (e.g. ensuring that when minor works take place they consider access).
- Procurement policies and procedures (e.g. ensuring access is a criteria in the tendering process).
- Heritage Sites/buildings (e.g. Providing access to all of the services provided in Heritage buildings regardless of ability).
- Day to day management of buildings including information provision (e.g. Carrying out access maintenance checks on a regular basis and making alterations as a result).
- Health, Safety and Accessibility (e.g. Safe evacuation of people with disabilities has been considered and is addressed in policies and procedures).

Figure 1 Key elements to make the built environment accessible.

It was clear from the outset of the service review carried out by O'Herlihy Access Consultancy in early 2012 that DIT and the Buildings Office are very committed to improving and making their services and buildings more accessible to all. Prior to the services review of the built environment, DIT had taken a number of previous

initiatives in relation to making their facilities, services and buildings more accessible. These included: Staff training on access auditing and Disability Equality Awareness; Engaging access consultants to provide accessibility advice on projects; Developing Codes of practice on equal opportunity in education; Initiatives relating to mainstreaming Assistive Technology throughout the campus; Policies and procedures in place relating to safe evacuation needs of students with disabilities in all of DIT buildings and leading the development of a module on Universal Design.

The second phase of this project was to develop a built environment Strategic Access Policy and Plan. The policy and plan outlines DITs commitment to accessibility/Universal Design and indicates how the Building Office will address the areas outlined in Figure 1 to ensure continuous improvement of the accessibility and usability of the built environment.

Since the Access Policy and Plan has been developed DIT has carried out a number of other accessibility initiatives including:

- The establishment of an access team and appointment of three access officers in order to meet the requirements of the Disability Act 2005 and latest best practice in relation to accessible service delivery;
- Mainstreaming Assistive Technology throughout the campus (i.e. A recent imitative was to install Read and Write Gold software on all college computers on the campus to assist students with Dyslexia).
- Reasonable accommodations for students with disabilities are provided by the DSSO and the BO as requested.
- DIT HSO has developed documentation in consultation with the DSS office to meet the safe evacuation needs of students with disabilities in all of DIT buildings.
- The Buildings Office has developed the DIT Strategic Briefing Document as part of the Grangegorman Campus Development. This document requires that accessibility and Universal Design be incorporated at all stages of a project including (but not limited to) briefing, planning, design, construction, post-completion and post-occupancy to ensure the building is accessible to all users regardless of age, size or ability and Indicates the design standards to be used as part of the development of the campus.

Universal Design for Learning Should Be Everyone's Business: The Case Study of RED@UCC

Darrelle Keegan, Patrick Kiely, Damien Drohan & Ewa Adam

Introduction

Resources for Education (RED) is a series of openly licensed resources and information developed to provide generic skills development and orientation to First Year Undergraduates in University College Cork. The inter-disciplinary RED Project Team chose five general subject areas initially which reflect the path of the student through undergraduate studies in higher education:

- Reading and Note-making
- Critical Thinking
- Writing and Plagiarism
- Assessment
- ICT Skills

Why was RED developed?

In September 2011, the Disability Support Service in response to a recognised need for introduction to third level education resource for First Year Students purchased a site license for a commercial generic Third Level orientation course by Palgrave called Skills4Study Campus. This resource covered topics including Critical Thinking, Exams, Writing and Referencing. Purchasing a ready-made resource from a third party presented a series of problems:

- there were accessibility issues from the outset both with some of the skills4study content and media and also with UCC's virtual learning environment, Blackboard Learn
- the resources were not specific to the student experience in UCC
- the engagement of the teaching staff with the resource was poor
- the resource itself was not sustainable due to the costs involved
- the resource presented only a limited series of options for customisation

A Project Team was established to look at these problems and suggest alternatives. This team brought together academic and administrative staff from Disability Support Service, Teaching and Learning, the International Centre for

Graduate Education in Micro and Nano Engineering (ICGEE), Ionad Bairre, the Teaching and Learning Centre, UCC Library and the UCC Students' Union. This multi-disciplinary team also brought a diverse skill set to the table which has helped inform our discussions on the development of Resources for Education @ University College Cork (RED@UCC).

What content was used?

A variety of content was used for RED: UCC generated content, existing UCC content repurposed to make it more accessible and creative commons licensed content from other international Higher Educational Institutions.

How does the RED project address Universal Design for learning?

Everything that is hosted on RED must comply with accessibility guidelines and Universal design for Learning. In accordance with W3C standards, RED ensures accessibility through the use of accessible fonts, formatting and through the use of accessible colour schemes.

The RED team are committed to the principles of Universal Design for Learning as articulated by the Centre for Applied Special Technology http://cast.org/index.html. This principles specify equitable access, intuitive design and flexibility in the design and delivery of curricula, resources and teaching. The RED team ensure that whereas the text is the foundation, this content is represented in a variety of media, using a variety of teaching styles to encourage the re-use and dissemination of the resources across UCC and to enhance student learning. RED content is available online with some video content currently. E-publications, audio recordings and additional interactive multimedia are currently being developed by the Team in collaboration with UCC staff. Universal Design for Learning offers significant advantages to all students but also supports the iterative development of educational resources by academic staff.

What is the importance of text for accessibility and Universal Design for Learning in the RED project?

The RED workflow which begins with Master text prior to storyboarding for online delivery has been adopted by academics developing their own online learning programmes. A university wide initiative to design, develop and deliver online and blended learning Master's Degree programmes over the next four years also

employs the same principles and workflow therefore guaranteeing accessibility and provided the basis for Universal Design for Learning.

How to embed Universal Design for learning in UCC and make it everyone's business?

RED is increasingly being seen in the University as an appropriate vehicle to deliver generic skills training for students and staff. The RED project team are in the process of adding Postgraduate and Staff resources to the website to further encourage insitutional engagement.
Student engagement with the RED content has far exceeded that of the skills4study based content from the previous year. Skills4Study use peaked at the beginning of the 2011-12 Academic Year with circa 400 individual logins before tailing off to an average of 80 unique users per week. RED, which launched in October 2012 enjoys 100-160 unique user visits each week. These numbers are expected to swell significantly as additional Colleges, schools and disciplines are rolling out generic skills training using RED in the 2013-14 Academic Year. Students have responded positively to the material. Academic staff are pleased to have RED resources as a building block for their own educational resources. Larger UCC wide initiatives such as First Year student retention engage with RED to reach a wider audience. RED now considered a part of the UCC technology-enhanced-learning ecosystem.

Teaching staff and particularly those engaged in online and blended learning delivery will be encouraged to use and modify RED resources more regularly thus building the sustainability of the project and leading to a wider variety of resources for students and academic staff to choose from.

This also promotes the development of accessible content that adheres to modern web standards. The RED website adheres to responsive design using HTML5 and CSS3 to ensure that all content is rendered to all devices: desktop, laptop, tablet and smartphone. This supports the Bring Your Own Device movement and mobile learning while facilitating accessible student learning as the student can engage with UCC content on his/her own device.

Academic staff appreciate that insofar as is feasible work on the iterative development of RED resources is future proofed. Imbuing these resources with

Universal Design for Learning principles will embed good practice in the university and in the teaching of all students.

The RED project team encourage engagement for content consumption and creation through availability on many platforms: the Web, Blackboard, Facebook and Google Plus. Regular staff briefing sessions are held also.
As the number of Creative Commons licensed resources will grow considerably with staff engagement, the Project Team are developing a Dspace driven searchable database using Dublin Core based metadata. This database will provide a user friendly starting point for academics wishing to ascertain 'what's out there' before they begin work on developing their own teaching resources.

The RED Project Team has ambitious plans for the future development of the resource. First and foremost additional vehicles will be developed to encourage student engagement. These will range from a more concerted media campaign to the delivery of more module style delivery based on learning outcomes.
In the 2013-14, the RED Project Team will see RED reach maturity with the website, database and Blackboard modules becoming one of the primary vehicles for generic skills training for undergraduate students, postgraduate students, PhD candidates and UCC staff.

Contributor Bios

Ewa Adam

Ewa has been working in the technology enhanced learning field since 2006 in industry and in higher education. In her current roles in the Tyndall National Institute and University College Cork she manages online learning programme development and delivery while also authoring new training content.

Prof. Martin Bean

Martin Bean is Vice-Chancellor of The Open University, the UK's largest academic institution and a global leader in the provision of flexible learning. Before joining The OU in October 2009, he was General Manager of Microsoft's Worldwide Education Products Group, where he focused on developing solutions to help the global education community. In 2012 Martin announced the launch of Futurelearn, the UK's first at-scale provider of Massive Open Online Courses. Born

in Australia, Martin - who holds a Bachelor's degree in Adult Education from the University of Technology in Sydney – now lives in Buckinghamshire with his wife and three daughters.

Maria Björklund

Maria Björklund, MLIS, is a librarian at Lund University, Faculty of Medicine. Liaison librarian for the programmes in medicine and public health and team leader of Support to teaching and learning. Maria is also contact at the Medical Faculty library for students with disabilities.

Andrew Blair

Andrew Blair has worked in Human Resources for 25 years in a number of roles in Ireland and England. His current role is Head of HR Business Banking for Bank of Ireland. Andrew has qualifications in Psychology, Sociology and Business. Andrews's interest in disability is through his work and ensuring all staff and potential staff are treated appropriately during recruitment & employment. He has previously worked with The Mary Hare School for the Deaf in England and the WAM (Willing Able and Mentoring) Programme in Ireland. He is on the Board of AHEAD.

Dr. Brian Butler

Brian entered third level education at University College Cork in 1992 as a mature student who was blind. After completing a BA, MPhil, and PhD in early medieval history he began working as a part time researcher for the Disability Support Service at the university and during this time completed an MA in Teaching and Learning in Higher Education. He now works as Advisor on Inclusive Teaching and Learning in Higher Education at the Disability Support Service, working closely with Dr Marian McCarthy, co-director of the Teaching and Learning Centre. As part of his work with Marian he contributes to the PG Cert, Dip and Masters programs in teaching and learning in higher education. His current areas of academic interest are universal design for learning, teaching for understanding and multiple intelligences theory.

Dr Gerald Craddock

Dr Gerald Craddock is the Head of the Centre for Excellence in Universal Design (CEUD) which is part of the National Disability Authority (NDA). Prior to taking this

position, he managed a national Assistive Technology department. He has also headed up several projects at both national and European level, with specific emphasis on technology in education and the development of services in the field of Assistive Technology. He has written a number of papers in the area of education and the use of assistive technology. A graduate from Dublin City University with a Electronic Engineering degree, a Postgraduate diploma in Social and Vocational Rehabilitation Management in University College Dublin (UCD), followed by a PhD from the Centre of Disability Studies in UCD.

Christoph Damm

Christoph Damm graduated from the BBW Chemnitz (Germany) in 2003, completing a education in Software Developing and IT Network Administrating. After involvements in IT companies and working in the field of IT administration of lager company networks, in the year 2006 he started working for the Support Centre for Students with Special Needs (Teiresias Centre) at Masaryk University (Czech Republic). His main responsibility is the administration of the Centre's IT infrastructure, studying latest developments on the field of assistive technology and the implementation of new technical support in the teaching environment at the Teiresias Centre as well as the development of individual software solutions aiming the support of disabled students at Masaryk University.

Ann de Graft-Johnson

Ann is an architect with expertise in equal opportunities and diversity. She is a member of the RIBA Equalities Forum: Architects for Change and formerly a member/director of Matrix Architects Feminist Cooperative. She works to redress the inequalities experienced by underrepresented groups in decision making which affects the built environment.

Katrien De Munck

Katrien De Munck is the coördinator of the Support Centre for Inclusive Higher Education, supporting higher education institutions in practice and policy on Inclusion. SIHO aims for equal rights and opportunities for people in Higher Education.

Damien Drohan

Damien is a qualified secondary school teacher with a background in civil engineering who has applied innovative uses of technology to his work in industry and in the public sector. He is particularly interested in utilising technology in teaching to help students reach their full potential.

Prof. Dave Edyburn

Dave Edyburn, Ph.D., is a Professor in the Department of Exceptional Education at the University of Wisconsin-Milwaukee. Dr. Edyburn's teaching and research interests focus on the use of technology to enhance teaching, learning, and performance. He has authored over 150 articles and book chapters on the use of technology in special education. He is the Past President of the Special Education Technology Special Interest Group (SETSIG) in the International Society for Technology in Education (ISTE) and Editor of the Journal of Research on Technology in Education. He is an Advisor for the National Center for Universal Design for Learning.

Dr. Antoinette Fennell

Antoinette is a User Experience and Universal Design researcher, promoting accessible, usable and desirable design specialising in design guideline development and user research to inform design.

Nicola Fox Hamilton

Nicola Fox Hamilton moved into psychology after a decade working in visual communications in Ireland and America. She has an M.Sc. in Cyberpsychology (IADT), and is a doctoral candidate in the University of Wolverhampton. Her research interests include online dating, language, individual differences; and she runs design workshops for non-designers.

Dr. John Gilligan

Lecturer in Computer Science, Universal Design and Assistive Technology, Accessible Web Design. School of Computing DIT. Research Interests:Universal Design, Knowledge Representation using ICF, Assistive Technology, Accessible Web.

Damian Gordon

Damian Gordon is a lecturer in Computing in the Dublin Institute of Technology, and has worked on several research projects in the field of Accessibility and Universal Design, including "*The PEARL Project*" the "*Inclusive Learning Through Technology*" project and *"The Employment for Education Project*". In 2007 Damian led the development of an MSc in Computing (Assistive Technology and Universal Design) for
the Dublin Institute of Technology in partnership with Dr. Ger Craddock and in co-operation from a wide range of stakeholders.

Ron Hamilton

Ron is a lecturer in the Department of Design and Visual Arts at IADT. He is a member of the Institute's Teaching and Learning Committee. He is part of the Visual Communications Design lecturing team. Subjects taught by him include: visual research methods, design and creativity, design principles, design and critical thinking, design for printed media, information design, typography, spatial design and motion graphics. Other areas of interest include: group work, collaborative processes, communities of practice, and transdisciplinary practice in design; teaching, learning and assessment; and technology for learning. Ron was awarded a Masters in Visual Communication (NCAD).

Darrelle Keegan

Darrelle has been working at the Disability Support Service since 2002. She is involved in a number of projects, and has a particular interest in academic skills development, universal design and new technologies.

Anna Kennedy

Anna has enjoyed a distinguished career in academia, private industry and the public sector. She is now bringing her expertise in adult education, continuing professional development and project management to her position in Teaching and Learning in UCC.

Patrick Kiely

Patrick has been working on digital humanities research and technology enhanced learning since 2005. He is currently project managing the development of online and blended learning Master's Degree Programmes in University College Cork.

Margaret Kinsella

Lecturer, Institute of Technology, Blanchardstown: Margaret has worked for 12 years in ITB as lecturer in computing and creative digital media. Her primary teaching and research interests are teaching programming, visual creativity and expression, universal design and personal development. Margaret worked in Roslyn Park College further education college (part of REHAB group) for ten years teaching programming and assistive technologies and before that in industry as software developer.

Kjetil Knarlag

Kjetil Knarlag, MA, is head of *Universell - the National Coordinator of Universal Design and Inclusive Learning in Higher Education* in Norway. Knarlag has worked on inclusion since 1999, first as an advisor of students with disabilities, and since 2003 on behalf of the ministry of education developing Universell as a centre of competence within higher education. Knarlag is a lecturer of universal design, and teaches both students and staff at several HEIs about UD as a strategic approach in developing an inclusive learning environment. He is also represented in the Norwegian Government's reference group about UD.

Siobhán Long

Managing Enable Ireland's National Assistive Technology Training and SeatTech Services with a special interest in championing Universal Design. Keen promoter of partnership approaches to problem solving, enabling individuals with disabilities to achieve their full potential through t he use of appropriate and effective technologies.

Tina Lowe

Tina Lowe has been working in UCD since 2008 in the Access Centre. She is a graduate of UCD with an MSc in Equality Studies. Prior to 2008, she worked in AHEAD as a Project Co-coordinator for the Get AHEAD program and the Access

Success program. Her current remit is to oversee the implementation of the requirements of the 2005 Disability Act for Universal Access throughout the institution. This includes the Built and Information environments.

Katie Lucking

Katie graduated in 2008 with a BA(Hons) in Architecture and Planning and in 2012 she completed an MA in Architecture and Critical Theory. In 2008-10 she interviewed disabled people about their experiences studying and practising as architects and contributed to the final report, *Disabled Architects: Unlocking the Potential for Practice.*

Kathleen Lynch

Kathleen Lynch TD is Minister of State, Department of Health and Department of Justice, Equality & Defence with responsibility for Disability, Older People, Equality & Mental Health

Dr Mark Magennis

Mark Magennis is founder and Director of the NCBI Centre for Inclusive Technology (CFIT), a centre of research, consultancy and advocacy in digital inclusion for people with disabilities. Mark is active in all areas of digital inclusion policy and practice and has authored national Irish guidelines for the development and procurement of accessibility ICT products and services. AS a researcher, he has managed European projects on assistive technologies, universal design tools and digital skills training. He holds an MSc from the University of London and a PhD from the University of Glasgow, both in Human Computer Interaction.

Sandra Manley

Sandra's concern about inequality of opportunity stemmed from a realisation that a disabled family member experienced profound discrimination. In her teaching, conference papers and writing, both in the UK and abroad, most recently in Turkey, she has criticised the way in which the built environment continues to exclude many people. In April she will be a keynote speaker in Jerusalem. A study for the RIBA, *Disabled Architects: Unlocking the Potential for Practice,* completed in 2010, raised concerns about the experiences of disabled people in architecture

and suggested curriculum changes to make designers more aware of the importance of inclusive design.

Lukas Masilko

Lukas Masilko gratuated from Masaryk University in 2003, completing a Master's degree in Teaching mathematics and computer science to high school students. In the same year he started working for the Support Centre for Students with Special Needs (Teiresias Centre) at Masaryk University. His main responsibility is teaching students with disabilities, namely visually and hearing impaired students of Masaryk University. He is also responsible for adapting and creating study materials for blind and partially sighted students of informatics and mathematics.

Leslee O'Loughlin

HR Manager, Ireland Group at Enterprise Rent-A-Car: Leslee joined Enterprise's Graduate Training programme in 1997 and was quickly promoted into key managerial and marketing roles within the organisation. In 2004, as Group Recruiting Manager Leslee developed strategic partnerships with universities in San Francisco such as Stanford and UC Berkeley. In 2007, Leslee was promoted to Human Resources Manager in Ireland. Since that time, Enterprise has partnered with colleges and universities to develop many key initiatives relating to diversity and employability, as well as launching a very successful international placement programme. Subsequently, Enterprise is the proud recipient of both a Gradireland Employability Award and an AHECS Engagement Award.

Patrick A. Matthews

M. Phil. in Applied Linguistics. Patrick is Assistant Professor in the four-year Bachelor for Deaf Studies Programme in Trinity College Dublin. He has served as Deputy Chief Examiner for the examination for the Leaving Certificate Applied in Irish Sign Language (ISL) since 2004. Patrick is on the committee of ISL Academy and is involved in the creation of curriculum and assessment for learners of ISL for this body. Patrick has numerous publications on the Deaf community, Deaf culture, the linguistics of ISL and for learners of ISL. Patrick was project advisor for the translation of the Commission into Child Abuse Report into ISL. He is developing a written system for ISL as part of his current studies.

Dr. Marian McCarthy

I am on secondment from the Education Department, UCC, where I taught from 1995- 2006, and am Co- Director of Ionad Bairre, The Teaching and Learning Centre, with responsibility for the Accredited Programme in Teaching and Learning in Higher Education, which provides certification for staff who wish to research their teaching and their students' learning. I have also been a member of the Department of Education and Science National In-Service team and Training of Trainers team (1992-2004)and acted as a referee for the Teaching Council (1996-2006). My publications are in the area of teaching and learning in higher education, specifically in the fields of Teaching for Understanding and the Scholarship of Teaching and Learning (SoTL).

Paul McDunphy

The D.I.T is the largest third level educational institute in the country. Our estate portfolio consists of 125,400 sq, over 40 separate buildings, and located right in the heart of Dublin City, providing facilities for over 20,000 students and 2,000 staff. The D.I.T is currently in the process of relocating to a single campus in Grangegorman close to Dublin city centre.

Dr. Joan McGuire

Joan M. McGuire, Ph.D., is Professor Emerita, Educational Psychology, and Senior Research Scholar at the University of Connecticut's Center on Postsecondary Education and Disability. In addition to more than 80 refereed journal articles, € 2.7 million in external funding, and editorship of the *Journal of Postsecondary Education and Disability,* she has received awards from the University's AAUP (Excellence Award for Teaching Mentorship), the Council for Exceptional Children, and the Association on Higher Education and Disability. Professional interests include universal design for instruction (UDI); postsecondary disability program development, administration, and outcomes; and program evaluation.

Anna Mia Eborn

Anna Mia Eborn, MLIS, is a librarian at Karolinska Institutet University Library. Coordinator of Customer Service and Students with disabilities.

Prof. Alex Milton

Alex Milton is Professor of Design and Head of the Faculty of Design at the National College of Art and Design. As a designer, educator, researcher and writer he aims to promote a critical, interactive and playful approach to design, creating new methods and formats to encourage meaningful consumer and audience participation in the production, consumption and interpretation of design. Designing *with* and not merely *for* people. Current research includes managing the Task Furniture in Education project, a €1.33 million EU research project. His most recent book 'Research Methods for Product Design', will be published by Laurence King this October.

Esther Murphy

Esther is a researcher for European funded life long learning projects at NCBI's Centre for Inclusive Technology. Esther has contributed to National Council for Special Education funded projects, led by TCD. From DCU she holds an MA in Intercultural Studies and a PhD on migrants with sight loss in Ireland.

James Northridge

James is currently working on developing a business intelligence tool in UCD. He is also working on a new E-learning platform in UCD to offer a masters online. His major passion is Assistive Technology mixed with E-learning, he is currently studied a Masters in Disability Studies in UCD. In his spare time he runs www.UrAbility.com, which aims to give advice for those with disabilities and he blogs on everything Assistive Technology. James has a background in IT & Business, studied his undergrad in UCC in Business Information Systems, he has previously worked in IT roles with Accenture & PA Consulting.

Niall O'Hanlon

Niall O'Hanlon is the Access Officer for the Electricity Supply Board. He presently manages the ESB Traineeship Programme for People with disabilities. The aim of the programme is to provide employment opportunities for 10 people with disabilities annually. This is paid work experience of between 6 and 9 months in a commercially focused environment, in a rapidly-changing industry. It is the 7th year of the programme and to date ESB has offered 76 Traineeships with the

majority of the Trainees being college graduates. Niall is a Wheelchair User and is married with 2 children.

Eoin O'Herlihy

O'Herlihy Access Consultancy (www.accessconsultancy.ie) was established in 2007 by Eoin O'Herlihy and is one of the leading specialists in accessibility training and consultancy management in Ireland. O'Herlihy Access Consultancy provides clients with expertise and strategic advice in the areas of built environment accessibility, services accessibility, Universal Design and making information accessible for all. Eoin O'Herlihy has over twelve years experience working in this area advising clients ranging from the National Disability Authority, Dublin Institute of Technology, Dublin City University, University College Cork, National University of Ireland, Maynooth, Limerick

Karl O'Keeffe

Karl O'Keeffe qualified with BA (Photography and Digital Imaging) from Dublin Institute of Technology (DIT) in 2001. After working as a photographer for a number of years he moved into the area of IT. It was while contracting for BT that he first started working with Enable Ireland and was introduced to Assistive Technology (AT). AT was a perfect fit for his skills and interests and he began to work directly for Enable Ireland within a pilot IT/AT role in 2007. In the subsequent years his role has evolved so that he now concentrates more on AT and he has completed an MSc in Computing (Assistive Technology) in DIT. Areas of particular interest are the use of emerging mainstream technologies as AT, Universal Design for Learning (UDL), Alternative Computer Access and AT for leisure (particularly gaming and music).

Ciaran O'Leary

As Head of Learning Development Ciarán has responsibilities for the promotion of enhanced learning strategies and coordination of academic quality assurance in the College of Sciences and Health. Ciarán spent 12 years as a Computing lecturer and researcher in DIT, primarily in the areas of ICT accessibility and Universal Design.

Dr Lisa Padden

Dr Lisa Padden holds a BA, MA and Phd from NUI Galway. She taught with the English Department at NUIG for five years before joining the Access Centre Disability Support team in UCD. Her teaching in NUIG focused on helping first year students with their transition to third level and she is continuing with this focus in UCD.

Dr. Marion Palmer

Dr Marion Palmer is Head of the Department of Technology and Psychology at IADT and chair of the Institute's Teaching and Learning Committee. She was awarded a doctorate in education at Queen's University Belfast on teaching in Irish Institutes of Technology in 2009. Marion is chair of the Learning Innovation Network Coordination Group www.lin.ie and a NAIRTL Award of Teaching Excellence winner for 2011.

Jiri Pecl

Graduated from Masaryk University in Brno, Faculty of Sciences in 2005, completing a degree in Teaching mathematics and descriptive geometry. He started teaching mathematics to deaf and hard of hearing students at MU as an external employee of the Teiresias Support Centre in the same year, and he became a full-time employee in 2009. He teaches mathematics to students with disabilities, mainly deaf and hard of hearing students, and he is also responsible for the coordination of Czech sign language interpreters at MU.

Dr. Micheal Shevlin

Michael Shevlin teaches in the area of inclusive education and works with both student and experienced teachers on ITE, Masters and PhD programmes. Michael has been involved in a number of international research collaborations and has published widely in the area of inclusive education.

Bernard Timmins

Currently a lecturer in DIT. Main areas of interest are Assistive Technology & Universal Design, and Biomaterial testing. Educational interests include students learning within the community, and presently serve on DIT's Students Learning With Community (SLWC) advisory board. Currently working with our community

partner Enable Ireland to develop and organize the Community Design Competition, which champions universal design to 3rd level students through YouTube videos that detail the design competition benefits.

Julie Tonge

Julie Tonge holds a BA from Queen's University Belfast and a Dip. LIS from the University of Wales. She joined the Access Centre Disability Support team in UCD as the Access Librarian before taking up the Disability Adviser position in 2011. Her focus has been on fostering a culture of independent learning amongst students with disabilities and designing and implementing a suite of pre- and post-entry supports for these students.

Dr. Mary-Liz Trant

Mary-Liz Trant is the Head of the National Office for Equity of Access to Higher Education, in the Higher Education Authority (HEA). The Office oversees implementation of the National Access Plan as well as managing funding programmes that include the Fund for Students with Disabilities in further and higher education; the Student Assistance Fund; core funding to support equality of access; and the Springboard initiative for unemployed people. Before joining the HEA Mary-Liz taught at both second and third-level, and held a senior post in the Further Education and Training Awards Council. Mary-Liz has a doctorate in Education; Masters degrees in Education and in French; and a Higher Diploma in Education. She has published on equality of access in education; inclusive teaching and learning, curriculum development, assessment; and the liberal vocational ideal.

Declan Treanor

Declan Treanor is Director of the Disability Service in Trinity College Dublin a role which involves the development and implementation of strategic priorities relating to widening participation of disabled students and staff in Trinity. Declan has worked in a variety of educational, local government and NGO contexts establishing voluntary organisations, teaching 2nd and 3rd level courses before joining Trinity to set up the Disability Service in 2000. Since then, Trinity's work in widening participation of disabled students has expanded enormously and now comprises a continuum of programmes for primary school pupils right through to post-graduation.

Meggie Verstichele

Meggie Verstichele works at the Support Centre for Inclusive Higher Education, supporting higher education institutions in policy and practice on Inclusion. SIHO aims for equal rights and opportunities for people in Higher Education. SIHO follows the recent insights on Universal Design for Learning, organizing for example coaching and training on this topic for the field of higher education.

Tina Wilhelmsson

I have a master degree in Political Science and many years experience working with organizational development and method development. At SFS I work to increase participation in student unions for students with disabilities by universal design methods for accessible meetings, communication and social activities.