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Three Decades of Universal Design - Defining Moments

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Abstract. This paper contributes to the growing research on incorporating Universal Design in the Higher Education landscape by presenting a Practitioner's Perspective on Universal Design as delivered in the Institute of Technology, Blanchardstown (ITB) in the first year of a creative digital media degree as part of the first year experience. This first year experience is a transition time for many students and has many complexities; while being an exciting and fulfilling time, the transition can also be challenging and isolating. Through Universal Design, the aim is to enable students to 'Get connected' and 'Stay connected'. Universal Design for Learning is explored through changes in curriculum design as a means of enhancing student engagement [1]. The Universal Design framework is structured into three strands; providing multiple means of representation; providing multiple means of action and expression and providing multiple means of engagements. The broader perspectives of Universal Design are considered at Institutional level. Resources, practices and attitudes, Michael Fullan suggests, are the three critical elements required for change to occur [2]. 'The Power of Moments' [3] and why certain experiences have extraordinary impact, coupled with underpinning Universal Design for Learning guidelines is considered in curriculum design and how they may enable meaningful engagements. The role of creativity and innovation suggests a way of interlacing universal design with the power of moments, acknowledging the critical elements for change to move from UDL exploration to integration. This paper highlights case studies where all these interrelated forces intertwine with emotional learning and how embedding Universal Design enables transformation. These are design models and are still to be evaluated.

Keywords. Universal Design (UD), Universal Design for Learning (UDL), change, curriculum, course design, inclusion, marginalised, connections, student voice, engagement, emotional learning, transformation

1. Introduction

Diversity and inclusion require new approaches in higher education to enable more students engage with their college experience. The initial strategy is to teach **Universal Design** (UD) as a module for first year undergraduate programmes and embed the **Universal Design for Learning** (UDL) framework [1] for the Higher Education landscape to develop expert learners. Universal Design for Learning provides for: multiple means of representation; multiple means of action and expression; and multiple means of engagements to help create expert learners. Expert learners are resourceful, knowledgeable learners who are strategic and goal-directed, purposeful and motivated students.

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Universal Design for Learning is considered from the perspective of two paradigms. Michael Fullan's three critical elements for change in Higher Education to occur and Chip and Dan Heath's four defining moments elements are both useful to the discussion of the importance of student experience and student engagement.

Resources, practices and attitudes, Michael Fullan suggests, are the three critical elements required for change to occur [2]. While human experiences are endlessly variable, Chris and Dan Heath outline that positive memorable moments are dominated by four elements: elevation, insight, pride, and connection [3]. This case study will illustrate the college's journey with Universal Design through the following elements:

- Re-imagining Practices
- Developing Resources
- Invigorating Attitudes
- Capstone Projects

With creativity and innovation Universal Design for Learning can re-imagine practices and attitudes and generate more defining moments providing a transformational experience for many marginalized students.

The application for designation as a Technological University provides momentum and opportunity for new social justice in education.

2. Three Critical Elements for Change in Higher Education

2.1. Re-imagining Practices

Universal Design for Learning (UDL) is a research-based set of principles to guide the design of learning environments that are accessible and more effective for all students. David Rose and his team at CAST (Rose, 2017) suggest "all students benefit when they are given multiples ways: to take in new information; express their comprehension; and become engaged in learning". This re-imagined practice acknowledges student variability, individual differences, learning preferences and interests and life struggles and is essential for widening participation and increasing student success resulting in flexibility and choice in terms of content, delivery, engagement and assessment. Building community by designing innovative workshops and assessments to assist in 'getting to know one another' and identifying strengths is an initial core step.

2.1.1. Memorable Moments

The Heath Brothers are interested in creating defining moments and in the higher education context to help improve the experience of students. How can these elements be considered when designing curriculum? What is it when Students remember higher educational 'highs and lows' and what are defining moments? How can memorable moment's best be incorporated in the curriculum as part of the first year experience?

Four categories of defining moments emerge. Moments of elevation "lift us above the very day, inspiring emotions such as a deep sense of engagement". Moments of insight "rewire our understanding of ourselves or our world". Moments of pride "capture us at our best" and moments of connection "deepen our ties to other people" [3].

David Rose aspires to "making optimal learning a promise fulfilled" (Rose, 2017) and the college is exploring UDL practice with creative curriculum design and engagement by developing a schedule of creative workshops, peer mentoring, guest lecturers and field trips extended throughout the semesters to build confidences and build relationships. Guest lecturers further enhance the underlying practice to 'make real' and 'make connections'. External trips allow for new perspectives, new concepts, new thinking, new places and spaces, new relationships and projects. Setting up scenarios where students get to meet and converse with a wide variety of people and backgrounds enable memorable moments of insight. For example a trip to Assistive Technologies (AT) providers, provides further expanded student knowledge and provided deeper understanding of the role and significance of AT and universal design in people's lives. Memorable moments of insight were fostered when visually impaired people visit and illustrate technologies that enable and the converse impact of poor design. Storytelling narrative from fellow students is profound for students as many share their personal journeys of adversity, isolation and discrimination. This important input is also profound for academics as also learners in the Higher Education landscape; learning about humanity and learning journeys.

Capturing the student voice, student engagement initiatives and providing multiple pathways through curriculum are some of the re-imagination strands. This exploration has been enhanced with the role of creativity and innovation. "The core proposition is that participation in cultural activity drives personal and collective creativity with significant implications for individual and societal wellbeing and achievement" [5].

2.2. Developing Resources

The challenges of re-imagining higher education provision relies on the importance of developing resources collaboratively. The Centre for Excellence in Universal Design (CEUD) collaborated in the development of a Universal Design Higher Education module and this is now embedded in a number of undergraduate programmes in Ireland. This resource is a fully documented Universal Design module set of curriculum resources and materials [6] including:

- Lecturer slide set and notes
- Animated personas narration 'The Normal Family'
- Case studies and Design Projects

The college has been involved in developing additional resources; video recordings, creative artefacts and digital materials. Innovative resources are regularly creating by students for assessments when briefed to create resources to increase universal design awareness. Frequently these resources allow students to immerse themselves in design. Recently the inclusion of material from a European Accessibility Partnership [7] offers video, audio and text inputs with significant end user input.

Many conference presentations and workshops are now available as resources, providing a wide range of topics and interests from European and International perspectives. These extensive resources are rich in content and the numerous pathways through these resources allow for flexible delivery and student choice [9, 8]

2.3. Invigorating Attitudes

The universal design philosophy and motivations, and the universal design for learning framework have been instrumental in evolving attitudes. Furthermore Universal Design for Learning offers the possibilities for transformation through innovation and creativity conference workshop [9]. The importance of carving time in the curriculum for academics to build relationships with students; acknowledging student's individual learning journeys, having conversations on student's interests and mapping opportunities are the attitudes currently being explored to realising individual potentials.

2.3.1. David Rose and CAST

David Rose strongly suggests the "emotional response to learning" needs recognition and understanding and the challenge is to weave this into curriculum design, learning processes and student feedback [4]. The Centre for Excellence in Universal Design suggest "the attitudes of teachers at early stages of training, the attitudes of mentors or supervisors, and the attitudes and actions of professional bodies representing designers are likely to all shape an individual's entire design ethos" which reinforces the importance of aligning shared attitudes [6]. Anne Meyers recommends creating learning environments that can "support affective and motivational development" (Rose, 2017) Huge opportunities have been leveraged in creating experiences and opportunities for students at related conferences, such as the Higher Education in Transformation Conference [9], Education across the Continuum: Innovating through Universal Design 2015, and a number of Universal Design Hackathon events. Many further innovations spark and student talents and opportunities emerge.

2.3.2. CHERPP (Centre for Higher Education Research Policy and Practice at TU4D, Dublin UOIT and Durham College, Toronto)

The recent partnership development of the Centre for Higher Education Research Policy and Practice (CHERPP) between TU4D, Dublin, University of Ontario Institute of Technology (UOIT) and Durham College, Toronto sees the emergence of collaborative research and practice projects sharing Michael Fullan's themes around transformation. Universal Design in ITB plans to further connect Irish contemporary poetry with a unique Canadian artist to further connect the voices of higher education, with the aim of insightfully charting student voices and student journeys.

To deliver on this promise of equal opportunities for all seems more possible with multidisciplinary international motivated partners sharing the vision and aligning more education business with equal opportunities.

Heath Brothers' Moments of Connections importantly created in groups "that bond by virtue of struggling together toward a common goal", relationships begun in HEIT 2015, developed further at HEIT 2017, Universal Design 2016 and now UDHEIT2018. Conversations, dialogues, debates, a welcoming of new colleagues and partnerships, projects and connections.

3. Universal Design for Learning Practice: Capstone Projects

3.1. Connected Voices in Learning Exhibition

A recent collaboration launched an innovative exhibition entitled Connected Voices in Learning [10], aiming to celebrate the huge diversity of people in the higher education system through the lens of universal design for learning (UDL). Learners have revealed the richness of their personal learning stories by contributing personally designed stamps and participating in the creation of an inspiring group poem.

Through collaborations with the Association for Higher Education Adults with Disabilities (AHEAD) the Student Voice was captured; their hopes and aspirations developing a way of believing that "anybody can be the person they dream of being" and seeing their struggles and fears as "keeping us back all the time, holding us down, like chains or anchors" and defining the task of educators "to look for what we can't see in ourselves".

3.1.1. Learning Journeys Postage Stamps Poster

A postage stamp was once a key medium to connect individuals and their stories. It carried the power to transport personal thoughts and feelings around the globe. The postal service was responsible to guide each unique letter through the "great interconnected public communication network". In a sense reminding educators of role—"interconnected with each other to provide the guidance, support, direction and love to ensure that each learner arrives at their chosen destination" [10]. A poster of individually designed postage stamps reflecting individual learning journeys is now available and reflects the unique qualities of learner journeys—the inspirations, the personalities, the barriers, struggles and successes.

3.1.2. Collaborative Poem

A heartfelt collaborative poem (Appendix Connected Voices in Learning) was co-written by writer Colm Keegan and the first year students over a number of workshop sessions. The students have participated in live performances at Conferences with a finale at the National Art Gallery. 'A life changing event' mentioned several students while others citied "learning they will never forget". Leaning on the words and sentiments of previous students this poem is integrated into the induction programme for new intake of first year students making the transition to third level education.

The poem now takes pride of place in every first year student's handbook in the college. Copies of the work are on display, framed and unframed in many corners of the college, inter-connecting departments, from Human Resources to Finance, from examinations to admissions and linking academic offices, attempting to reframe our approach to student diversity. The ripple effects of this poem have been significant, copies of the poem feature round the globe, perhaps just as significantly, iteratively 'defining moments' as new groups engage with the student voice. This poem allows for memorable moments of humanity and the hope which education can bring to the dreams and aspirations of many students in their learning journeys.

3.2. DELL Corporation Universal Design Debate Series

Annually ITB students participate in a Universal Design Debate held in Dell, Ireland in conjunction with Engineers Ireland, Dublin Institute of Technology (DIT) and Dublin City University (DCU), taking place in Engineers Week, and organized by AHEAD. Epic film series are at the core of the debate with universal design as the underlying theme. For instance, in 2017 Star Wars was the theme for the debate with "Was Darth Vader a good engineer?" as the motion for the debate and to consider his strong 'engineering force' and his disability. This debate seeks to address what engineers of the future need to be? What engineers of the future need to consider? Engineering with a disability – what students with a disability can bring to engineering. Engineers and what they need to consider when developing assistive technologies? What is key to this debate is "what do you believe a gifted engineer looks like". It is time to challenge assumptions and consider good design. An additional challenge is to debate "without words", again challenging assumptions and prioritizing new ways of working and new ways of expression.

Followed by Iron Man, in 2018 as the theme for the debate with "Iron Man: Artificial Intelligence or Assistive Technology?" as the motion for the debate. The brief expanded this motion with Tony Stark, after suffering a severe chest injury which led to his disability, creates a powered suit of armour capable of amazing and powerful things and named himself Iron Man. But who does the power lie with, Stark or the suit? Can Iron Man's impressive shell be called Assistive Technology or Artificial Intelligence? Students in this debate, grabbled with what makes one thing AT and the next AI, considered where is the line between AT and AI technologies at use today the role of good design.

ITB were successful winners for both these years. Perhaps more successfully, however, was the student engagement, action and expression aspect where students self-elected to contribute in a multitude of ways. From project planners to poster printers and everything in between. Homemade Princess Lea costume at front of parade, roles evolved such as script writers, animation capturers, video editors, 'rebuttal-ers', 'humour contributors', illustrators and artists. Leveraging Maker Spaces, harnessing 3D printing, creating sculptures, using mixed media, carpentry and metalwork resulted in fine expressions for the debate without words.

Curriculum design "must always ensure that the student voice is central in the development of educational practices" [11] is the opening argument in the Universal Design for Curriculum Design Case Studies publication. During design thinking workshops students were facilitated to design their own research and learning and this new curriculum was moulded into a new Universal Design Research Week Lunchtime Lecture Series. Academics facilitated and organised guest lecturers and industry speakers to present lectures and workshops on the debate topics designed by the students. An interactive week consisting of lectures/workshops on Artificial Intelligence, Assistive Technologies, The Theory of ISMS (Humanism), How best to present student debate in CVs and E-Portfolios. Concepts, critical thinking, vocabulary and practical skills featured. Attendance and participation was extremely high.

In the UDL Model, Rose suggests "assessment point not primarily at student performance but at curriculum performance" (Rose, 2017) and timing is a factor. Universal Design Research Week Lunchtime Lecture Series was early in semester ensuring students were available to participate while not yet working on any other module assessments. Additionally creating new dynamic in standard timetable delivery

of two hour lecture two hour labs delivery format for modules. Much work and collaboration happened early in term, with the added bonus of better assessment balance across semester working to the benefit of students and easing the fever pitch with assignment overload prevalent in many higher education programmes.

The debate event is organised by DELL True Ability and the participants comprise of DELL employees, industry employers and students. Strategically the event has been held on International Women's Day allowing for additional Universal Design themes and lively gender discussions. ITB Young Women in STEM participated and the event connected to Civic Engagement projects. Industry and academics present on Universal Design and speakers who had overcome adversity present and bring profound relevancy to the day. For example, this year students met a young woman who had lost multiple limbs in a house fire during her final state exams. She summarised her life before the accident, the days and months adjusting to the trauma and the journey and transformations bringing her to where she is now and bringing students in close reality to the sharp edges of life. Her demonstration of prosthetic limbs parallel video clips from Iron Man with film reel bionic power and demonstrating the empowerment and frustrations associated with Assistive technologies. On many levels this personal narrative ground Universal Design theory and practice. Moments of insight "rewire our understanding of ourselves or our world". Moments of Insights with the realization for many students that overcoming adversity is a journey, involving many successes and struggles and the powerful role of technology as an enabler. The role of Universal Design as an enabler is crystallised. Universal design knowledge and skills as a graduate attribute now becomes apparent and meaningful. Presentation of content in differing formats re-imagines the traditional two hour lecture format.

A DELL employee who had worked in DELL for two decades provided feedback that this debate day was very meaningful and felt "emotional engaged and inspired". Embedding UDL with debating models in curriculum design allows student and staff transformations to begin to emerge.

3.3. Maker Spaces

The philosophy is to design spaces to allow students create and make a variety of art and technology artefacts. Designing innovative projects and creative maker initiatives such as 'Christmas Contemporary', 'Inclusion Chair', 'Knitted Communities', '101 Images' and 'Identity Photo Booth' enhance the college's first year experience.

This is important as it provides the space to allow students connect and build relationships with each other and with academics, 'Design to Shine' might be a pedagogy where nuggets of student ability and interests begin to emerge. Trust can be formed and conversations and dialogue can develop around student interests and challenges earlier than perhaps in the traditional lecture theatre.

Universal Design is committed to highlighting student artwork or technology creations. Two recent examples include a presentation from an ITB student entitled 'Diversity Deer' to Microsoft Washington's Universal Design Strategy department. Presentations of original Iron Man artwork from a Creative Digital Media student is now on proud display on the DELL EMC, Ireland wall. Student engagement is enhanced as students present their work to industry leaders, government ministers, presidents and international panels. First year students begin to see their roles as ambassadors in a new light, reframing their identities and creating new possibilities. The transformative powers of maker spaces in UDL curriculum design begin to emerge.

3.4 Universal Design and Mental Health

At the Universal Design 2016 Dublin conference Dr. Tom Collins outlined a number of key societal issues education should address, with mental health and wellbeing as one of these key issues. In response to this Universal Design is embedding contemplative pedagogy and providing workshops on mental health for students as part of the first year experience. Students are making connections with support staff and counsellors and the National Learning Network; commencing initially with workshops, proceeding to conversations and facilitating valuable thought capture through creative expression. The 2017 – 2022 Creative Ireland strategy suggests promoting creativity provides us with a "strategy for individual wellbeing, social cohesion and economic success" [5]. The Heath Brothers intimate that 'responsiveness deepens ties' and these moments of connection bond people together and students may feel more connected. Embedding mental health and wellbeing models in the UDL curriculum design allows student and staff transformations to begin to emerge.

3.5 Universal Design for Learning Erasmus Plus Project

AHEAD invited ITB to explore UDL as part of a European Erasmus Plus project. European workshops were designed and held in ITB with ITB students participating with other participants across Europe, followed by European workshops and conferences in Norway and Belgium, resulting in the publication of "Universal Design for Learning a Best Practice Guideline". Interesting aspects outline stakeholders, roles and responsibilities in implementing UD and UDL in Higher Education at the macro, meso and micro level. Heath's Moments of insight abound: with epiphanies as students and staff from over Europe shared experiences, aspirations and struggles, exploring Universal Design for Learning.

4. Thirty Practitioner Years: From TIDE to AAATE Conference Conversations

My own habitus was creative, innovative and entrepreneurial, alongside the usual discords and tensions, trying to connect and making connections. Waterford RTC was my first of many college educations and computer science my enthused discipline. Art, pencil and colour were my happiness. Growing up on family farm provided an abundance of materials and nature's best spaces; lanes and fields and rivers, trees and orchards, barns and outhouses, summer houses and workshops. Being a dreamer and a pragmatist created intersecting worlds. Software industry took initial workforce focus. My own teaching career started thirty years ago as Rehabilitation Instructor in a third level college, teaching software development to adults with congenital and acquired disabilities. Universal Design in Learning was the key to Teaching and Learning. Variability was extensive. Access to 'mainstream' higher level education at that time was hugely challenging. Technology is an enabler (Rose and Meyer, 2017). Core educational ethos and terminology is evolving; 'mainstreaming', has been positively replaced with words like 'inclusive' and more positively moving towards 'universal design'. My first ITB project was drafting a college disability policy, followed by designing a Women's Network for women with disabilities. My first ever conference to attend was the Technology Initiative for the Disabled & Elderly (TIDE), in Paris, 25 years ago. More recently, last year, participated in the Association for the Advancement of Assistive Technology in Europe (AAATE) Conference, in Sheffield. Huge advancements in technology in the intervening time and yet was struck by the similarity of discussions, conversations and debate. Technology has advanced significantly, yet many similar access scenarios were still being discussed. While many students are benefitting from good design, many other students are struggling and isolated in their higher education experience. Academic staff in the main feel untrained in their provision for student variability and marginalised groups. Many successful exemplars exist but not yet as cohesive college policy and practice.

5. Conclusion

Diversity is a much talked of scenario in higher education today; the Connected Voices in Learning project is very significant in capturing the true variability of students and the very unique transitioning to third level education for college students. ITB is currently designing and capturing Connected Voices II with new learning journeys.

Christmas contemporaries, postage stamps and miniature chairs, all are creative makerspace expressions enabling students to 'settle a while' at higher education, make something and have a meaningful conversation in the process. Implicit in this is the space to possibly make a connection, dwell on life and possibly allow a shift in thinking, a reframing of identity, a dreaming and encouragement of new possibilities, in the support of fellow students and the consistency of academic staff. This is an effective way of embedding transformational qualities into the first year experience. Reflect on the old, acknowledge the struggles, unburden some of the shackles and dream of the new and strategize next steps.

Resources, practices and attitudes need constant refreshing. The UD philosophy and UDL framework provide a solid pathway to moving forward; to continue to create worthwhile accessible content; develop meaningful engagements and experiences; while extending assessments to include a wide variety of expressions for the variability of learners. If curriculum designers recognize the widely diverse learners and build options to support learner variability from the start, the curriculum as inherently designed can work for all learners.

How can Academics create more moments that can transform student life? Does programmatic review as a change vehicle adequately include scoping student engagement? Does the year one experience inspire students? How can contemplative pedagogy best be incorporated for students and staff? The student voice and its input is vital to driving targeted innovative research with so many competing forces in the higher education landscape. How can student engagement be prioritised? Michael Fullan's resources, practices and attitudes and Chris and Dan Heath's Memorable Moments allow practitioners a lens to reflect and shape next steps.

These explorations through Universal Design for Learning and student engagement design models are yet to be evaluated; many valuable narratives and student feedback exist and compilation, representation and evaluation are essential next steps.

The next chapter of CHERPP conversations and new Technological University continue to create new focus, time and space for the redesign of higher education programmes, ensuring resources, practices and attitudes have universal design at the core, creatively ensuring defining memorable moments for graduates. Maybe the social justice higher education landscape will have changed substantially at conferences 25 years from now.

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Appendix

Connected Voices in Learning

Here we come, from all directions, Like leaves on the wind in autumn Lone motes in the ebb and flow of morning traffic. Hopping off buses, jumping out of our parents' cars, waving goodbye or just walking. Some talking to others, most not, this is the first day after all we don't know anybody and we're trying to play it cool. looking around at where we are or staring down, at a map, a timetable, a mobile phone. Drawn towards the same place with that name we've been savouring, repeating to our parents, our friends, to anyone who'll listen. This morning, we're going to college.

College stepping into our tomorrow.

Weighed down with back packs, folders, tablets, laptops, pens, coffees, bottled water,

for some that's plenty, maybe too much. For others - that's nothing, because we're carrying something else anxiety, or something bigger, maybe; the hangover of a one night stand gone wrong, an argument with a cheating lover, a recent death in the family, a problem with drink, or drugs, or both. Or maybe we've once been told that we're simply the wrong sex, the wrong religion, too old, the wrong colour, not fit enough, disabled in some way that didn't make the grade before. Maybe school just never felt right, maybe this is our second try, maybe that's keeping us back all the time holding us down, like chains or anchors. Maybe we're here, but ready to bolt ready to throw it all away, but we won't, not yet. In our hearts we've stowed away hope humanity's oldest motivation and like flames inside our ribcages we hold our dreams, some almost extinguished some undiscovered like distant stars and all we ask from you is that you see this and give us a few things. Consistency, an environment that cares for our minds, our bodies, our souls somewhere to make friends. A system of mentors we can trust to turn up in both senses of the word. To look for what we can't see in ourselves. Experts who are out there, still learning themselves. Eccentric, stern, passionate, always inspiring us to work harder than we want to harder than we think we can. And if you want to know how hard it is for, just ask.

The best of you always do.

Give us these things and we all become part of the plan. A connected part of the whole. Like the intricate parts of a watch but less separate. So much more than just one cog, more like the people who invented the watch itself, or tracked the sun through the sky, plotted the cosmos or mapped the soft machinery of the human heart. Here we come, from all directions like leaves on the wind in autumn students who want to to stand as graduates not just of a college but of a way of life, a way of thinking, a way of believing that anyone can be the person they dream of being.