Universal Design for Curriculum Design

Case Studies from **University College Dublin**

UCD Access & Lifelong Learning

Edited by Lisa Padden, John O'Connor & Terry Barrett

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Contents

Section 1: Major Curriculum or Student Support Innovations

Section 2: Classroom Teaching and Learning Processes and Materials

Section 3: Assessment

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We simply asked…

What was difficult?

...and

What helped?

SECTION

1

Major Curriculum or Student Support Innovations

Chapter 1: Introduction

Lisa Padden, John O'Connor and Terry Barrett

What do students say they want from university teaching and learning?

We must always ensure that the student voice is central in the development of educational practices. The feedback above came from students linked with UCD Access & Lifelong Learning who were asked simple open questions about their experiences in an anonymous online survey. We asked only: what helped and what was difficult?

These students overwhelmingly asked for more **clarity**, more **flexibility** and more **feedback**. Universal Design offers an approach which ensures the clarity, flexibility and feedback sought by students.

What is Universal Design for Teaching & Learning?

Universal Design is a principle-based approach to designing university teaching and learning to meet the learning needs of all students. This includes the needs articulated by the UCD students quoted here. Higher Education has become increasingly diverse, with a particularly rapid change in the last ten years. As we now strive to achieve widening participation of those students traditionally under-represented in Higher Education, and open our campuses to increasing numbers of international students, we must ensure that our teaching and learning develops in line with the student population. Universal Design (UD) offers us a framework that helps us to consider and embrace our diverse classrooms. While we may not all be experts in particular disability types, using the UD framework gives you the tools you need to take all learners in to consideration when planning and designing your curriculum.

Why this book on Universal Design?

All university staff who teach or support student learning want their teaching and

"...the best stress reliever is having a good teacher who is easily approached I think.

We really need classes on how to approach group work and presentations.

It is helpful when the lecturer makes it exceptionally clear what's wanted from an assignment, group project etc.

We need more tests which are worth less percent of the final mark.

...a few lecturers I had that put lecture slides on blackboard before lectures. I found this very helpful as I went into the lecture with the slides and it helped me to take better notes.

At the start of the year we were and are all very stressed about writing essays and not knowing what standard is expected or especially how to reference correctly which stresses me out as I fear I will lose a significant amount of marks."

FROM STUDENTS

learning approaches to be designed to meet the learning needs of all students. The introduction to this book gives an overview of Universal Design principles together with simple things we can all do for Universal Design in our teaching. There are three main sections in the book.

1 **Major Curriculum or Student Support Innovations**

2 **Classroom Teaching and Learning Processes and Materials**

3 **Assessment**

If you are particularly interested in one of these aspects of teaching and learning you may wish to go straight to that section.

Traditionally those designing programmes and modules may have thought about the 'typical student' when completing this process. However, this approach must be abandoned when we consider the makeup of the modern Higher Education campus including: international students, students with disabilities, students from socio-economically disadvantaged backgrounds, mature students, part-time students and school leavers. While many may think that the typical student in Ireland is an 18 year old coming to Higher Education directly from their Leaving Certificate Examinations (and thus trained to succeed in text-based education), this is increasingly not the case. We cannot make assumptions about the educational backgrounds of our students as teaching to only imagined typical students creates barriers for all students in our classrooms. Even those students who may seem to fit this profile of a "typical student" have a variety of learning preferences which are ignored when we offer only one type of educational experience.

At the core of Universal Design is a focus on variety and choice for students, a movement away from the traditional didactic, often solely text-based, classroom practices of the last century and the embracing of a more dynamic, active and evolving classroom.

Figure 1: Students relaxing in UCD's Global Lounge

Nine Principles of Universal Design for Instruction

PRINCIPLE 1
Equitable use

PRINCIPLE 2
Flexibility in use

PRINCIPLE 3
Simple & intuitive

PRINCIPLE 4
Perceptible information

PRINCIPLE 5
Tolerance for error

PRINCIPLE 6
Low physical effort

PRINCIPLE 7
Size and space for approach and use

PRINCIPLE 8
A community of learners

PRINCIPLE 9
Instructional climate

Principles of Universal Design and simple strategies for implementation in your own teaching

The nine principles of Universal Design for Instruction presented here were developed based on empirical evidence gathered by McGuire and Scott using focus groups of third level students with Learning Disabilities (LD) (McGuire & Scott, 2006). It should be noted that LD, as defined in the US where McGuire and Scott carried out their work, is not a single condition or disorder but includes a range of disabilities in the areas of reading, language and mathematics. The principles are all discussed here starting with a student quote from our feedback and also including advice on how you can implement the principles in your own teaching.

Principle 1: Equitable use

> "Having the slides before class means I can focus on what is being said and not panic about what I might miss"

All students should be able to participate fully in their classes and be given the opportunity to meet learning outcomes, preferably with the same opportunities for engagement offered to all students. Implementation of this principle includes the provision of accessible class materials.

Figure 2: Students watch a video clip for discussion in class

Application of Universal Design should mean that all students are able to access the same set of notes/materials without the need for any student to be provided with an alternate format or additional explanative materials. A simple strategy is to use a variety of learning materials e.g. slides, documents, visual material, video clips, and textbooks – using a variety of teaching materials allows as many students as possible to engage with the content based on varying learning styles and preferences. Chapter 7, **College Knowledge: Helping Mature Students Transition to College**, demonstrates this principle well as all students are provided

with the scaffolding materials needed to succeed. A contentious issue here is the provision of slides or notes to students using the online learning environment as staff are often concerned about a drop in attendance if this material is provided. However, research shows that provision of materials, even recordings, does not impact negatively on attendance (Larkin 2010).

Principle 2: Flexibility in use

> "The best modules are the ones where there isn't just essays or just exams - there's a mix and the work is more spread out."

This principle emphasises the need for the use of variety and flexibility in approach. Inclusive teaching obviously includes a diversity of instructional methodologies. A simple strategy for all lecturers is not to have an over-reliance on the traditional lecture model but to provide a variety of methods of instruction such as discussion, group work, interactive exercises, use of online resources and/or use of audio/visual material. Teaching approaches must take into consideration varying learning styles as reliance on any one teaching style will inevitably result in the disadvantage, or even exclusion, of some learners.

Research has shown that instruction which allows students to learn in a way that suits their individual learning style improves student performance outcomes (Higbee, Ginter, & Taylor, 1991; Lemire, 1998). Choice of assessment can form a vital part of an inclusive and flexible teaching approach. Thompson et al. (2002) note that "universally designed assessments are designed and developed from the beginning to allow participation of the widest possible range of students, and to result in valid inferences about performance for all students who participate in the assessment" (p. 6).

Figure 3: Interactive workshop

Geraldine O'Neill (2011) has completed a project on choice of assessment in UCD and as a result has developed a useful tool for ensuring that various assessment methods used are equitable: **A Practitioner's Guide to Choice of Assessment Methods within a Module**.

Chapter 11, **Debating: How to Advance your Students' Communication Abilities**, is a great example of a creative and flexible assessment method using both debating and reflective writing as part of the process.

Principle 3: Simple and intuitive

> "I have a lecturer who laid everything out clearly at the start of the semester including the reading, classes, exams and everything. Even though this was a tough module knowing this information from the beginning made it much less stressful."

This principle outlines the need for transparency and ease of use with regard to module content and assessment. Students should be able to ascertain all necessary details regarding topics to be covered, full reading lists, and assessment methods before choosing or beginning a module. A simple strategy for all lecturers is to provide students with a clear marking rubric to ensure that they know how each of their assessments will be graded. Students should also be given detailed instructions for assessments, including, where possible, sample answers (not based on the specific topics covered) to ensure that they know exactly what is expected of them. There should also be consistency across modules with regard to the amount and level of difficulty associated with assessments. Eliminating unnecessary complexity in the material being presented to students is also vital. Research has shown that poorly designed textbooks, for example, that do not incorporate Universal Design principles can be difficult for students to access (Jitendra, Deatline-Buchman, & Sczesniak, 2005; van Garderen, 2006.). Teaching staff should closely review the reading materials given to students in order to circumvent any potential problems students may have in accessing/ understanding the material being presented, with a consideration of the principles of Plain English. Chapter 3, **Navigating Semester One: A Roadmap for First Year Undergraduate Students**, is a great example of this principle at work as the success of The Roadmap outlined relies on its simple and intuitive design.

Principle 4: Perceptible information

> "When lecturers use slides that are packed with information it is impossible to read that most of the time"

This principle further highlights the need for all material to be provided in an accessible format for all students. A simple strategy for all lecturers to improve accessibility is to use a sans-serif font such as Ariel with a minimum font size of 24 in PowerPoint. Creating alternative format materials is often a costly and problematic practice which can result in loss of equality for students and a significant investment of time during busy term time from faculty and support staff. Providing online or digital versions of texts removes a number of barriers for students including cost and often accessibility.

Figure 4: Students reading and studying together

The provision of digital material allows students to access it in a variety of ways including on-screen, using a screen reader, or in a printed format and helps to alleviate the financial burden of purchasing expensive texts. Reading lists should be reviewed regularly with a view to providing as much of the material as possible in an accessible digital format. This may involve liaising with library staff and/or publishers. Compliance with **Web Content Accessibility Guidelines 2.0** and guidelines for producing accessible material should also be ensured. Institutions should also ensure accessibility is a condition of procurement at all levels. It is the responsibility of those buying/sourcing software packages or interfaces to ensure they are accessible to all users. It should not be assumed that all modern packages are accessible; for example, applications which use flash or present material in such a way that the text cannot be read by a screen reader can be highly problematic.

Principle 5: Tolerance for error

> "When the feedback isn't specific it's hard to know what to do for the next assignment. Sometimes it's very confusing and you don't know how to improve for next time."

This principle points to the problematic assumption that all higher and further education students come to a module with a certain set of 'core skills'. Students often come to modules without some of

the experience or skills assumed by their lecturer/tutor. This can be challenging as students can feel uncomfortable asking for help or clarification. It is vital that faculty keep in mind the diverse range of students in their class groups. Students with hidden disabilities or those with varying educational backgrounds are not always easily identifiable. An important strategy is embedding core skills into all modules to ensure that all students have equal opportunity to succeed. Having a programmatic approach to the teaching and development of core skills is an effective and integrated strategy.

Chapter 10, **Facilitating Students to Showcase their Research with Pride: Embedding the Presentation of Student Research into a Part-time Business Degree**, outlines an excellent programmatic approach to skills development. It is highly beneficial if some time is spent in each module ensuring that students have the skills required to complete the module. These skills may include academic writing, oral presentations, reading techniques or research abilities. Setting aside at least one hour in each module to review these skills, as well as providing resources through the online learning environment can help to ensure that no student is left at a disadvantage.

This principle also emphasises the importance of allowing students to track their progress throughout a module. Helping students to be aware of their own development can help them to focus on areas that need improvement. Often six or more weeks of a twelve week module will have passed before a student receives any indication of how they are progressing. This leaves little time for students to reassess and rectify their work from the first half of the semester. Faculty may wish to consider providing self-assessments through the online learning environment. Short self-administered quizzes can assist students in monitoring their progress and can help students to become more self-aware in terms of their own knowledge and learning practices.

Chapter 6, **"I'm a Busy Distance Learner" – Engage Me!**, demonstrates this principle, and the online modules discussed include a number of short quizzes and tests which students can use to gauge their own progress. In some modules it may also be appropriate and possible to provide a facility for submitting plans or drafts of continuous assessments. Allowing students to submit drafts of their work helps them to understand that producing a complete piece of work is a process of drafting and re-drafting. This would, of course, require extra time of tutors/lecturers. However, the result

of this practice would be much improved student work which must ultimately be the goal of education. There is also the possibility of the lecturer coordinating peer-review of plans or drafts.

Principle 6: Low physical effort

> "Lecturers rushing through slides that aren't on Blackboard [virtual learning environment] and students panicking because they can't write fast enough and will have no notes to reflect on."

This principle highlights the need to remove any unnecessary physical exertion. This includes excessive amounts of writing in class. A simple and effective approach for all lecturers would be to allow any student who requires it to record lectures or seminars for study purposes. This recording, together with the class materials available online, could allow students to be more comfortable in class as it removes the stress of 'missing' information. Providing audio recordings/podcasts of lectures can also be extremely beneficial. Although this issue can be sensitive, with a strict policy in place, students would benefit greatly from not having to write excessive notes in class.

Policies should include conditions of use and restrictions on distribution. Faculty might also consider allowing students to complete in-class tests using a computer thus minimising the amount of time a student must spend writing/rewriting and allowing for more time processing questions and composing answers.

Figure 5: A student taking notes in a lecture

Many students with disabilities already require the support of using a computer in exams, recording lectures, and receiving notes from lecturers/tutors. By embedding these policies into each module and not restricting the use of technology these students would feel more included in the group. This would remove the perceived stigma of being different from peers or needing 'special treatment'.

Principle 7: Size and space for approach and use

> "I love the classes where we do some exercises and it isn't all just crammed in to a lecture theatre trying to listen for 50 minutes."

This principle points to the need for faculty to think about how best to use the physical space available to them. Faculty should consider the space when planning the design and delivery of modules. A practical strategy for implementing this principle is ensuring you request and use active learning rooms which facilitate group work and enquiry/problem based learning as much as possible. The physical teaching space has a significant impact on the educational experience of all students. The integration of technology in the classroom environment, for example, can be of a significant benefit to students. However, if this technology is not used appropriately in the teaching space it can become cumbersome and distracting to students who are trying to engage with the material being presented. As noted above, teaching should be dynamic and inclusive and consideration of the physical learning space is vital in achieving this goal. Many students learn best when interacting or discussing material and making direct contact with their lecturer/tutor. The traditional model of students sitting in rows can become quite tiresome to students who often feel disengaged in this model. Physical refurbishment or retrofitting of existing traditional spaces can be prohibitively expensive so new ways of using the tradition classrooms and lecture theatres should also be encouraged.

Figure 6: Students attending a large lecture

While the physical environment may be somewhat restrictive, some creative re-purposing is vital if we are to move away from the traditional singular teaching method. This can include the flipped classroom approach, group work, think-pair-share, problem-based learning and student-led discussions.

Principle 8: A community of learners

> "In my favourite classes the lecturer gets everyone involved and there is no feeling of us and them."

This principle stresses the need for the development of a fruitful relationship among student groups and between faculty and students. It is the job of the faculty to provide opportunities for students to interact and collaborate with each other and with the teaching staff. Collaboration among students can have a positive impact both on student engagement and student retention (Elliot & Decker, 1999; Goodsell Love, 1999; Lenning & Ebbers, 1999, Tinto, 1998). Chapter 8, **Maths Sparks: Learning Maths, Teaching Maths and Widening Participation**, demonstrates this principle well as the Maths Sparks initiative works to form a community among second-level pupils, third level students and teaching staff. Peer Mentoring is a great example of how this principle can be effectively implemented. This has been highly successful in UCD and a number of other colleges. Faculty can encourage further collaboration and peer engagement by encouraging students to form study/discussion groups for each module. Study groups could be established in class and students encouraged to meet outside of class time where possible. Group study topics/questions can be set to help structure the study time and boundaries can be set and formalised.

Figure 7: Students studying together

Online discussion boards can be set up using the online learning environment and these can be a valuable tool for students who may not be able to attend campus outside of class hours. A closed/private Facebook group can also be set up. This can be a useful way for lecturers to communicate with students. Bringing their educational experience in to their social space encourages students to see college life as an important and interesting part of their life as a whole. However, the institution's social medial policy should be followed carefully.

Principle 9: Instructional climate

> "...a lecturer sent an email to all students in our module and said if there was anything that we needed extra help with to just let him know ... made getting help for any situation that may have caused stress much easier, and much less awkward..."

This principle emphasises the need to ensure that each student has a positive educational experience. All students should be welcomed and an explicit affirmation of inclusivity should be provided at the outset of each module. A simple thing all lecturers in UCD can do is check their class list regularly to see the list of students registered for disability support. Information and instructions on how to do this can be found on the **UCD Access & Lifelong Learning Website**. Often students with a disability, mature students, and those from socio-economically disadvantaged backgrounds have been told to lower their expectations with regard to their academic performance. A challenging and supportive learning environment can encourage all students to reach their highest potential. A statement of inclusivity should be provided in each module.

This statement should encourage tolerance of diversity in the classroom and should reassure those who would like to disclose information about their learning needs that this information will remain confidential and be treated with respect. Often disclosure can be difficult for students with 'hidden' disabilities so this encouragement is needed. It is the responsibility of teaching staff to communicate that all students will have 'equal access and equal opportunity' (Higbee, Chung, & Hsu p. 63). Pedelty (2003) emphasises the need for teaching staff to discuss this statement in their first class so that students are not left to merely read the statement on their own.

Figure 8: Students working together in class

“

This School/Department/Unit strives to be a model of inclusion. We respect and value student diversity in all of the modules we offer. We aim to provide and promote equal access and opportunity to all students regardless of disability, race, gender, sexuality or socio-economic status. Students are encouraged to approach staff to discuss their learning needs. Any information disclosed will be treated in the strictest of confidence.

”

Sample Inclusivity Statement

Chapter 4, **Assisting the Individual: Practical Interventions to Assist in Student Retention**, demonstrates this principle well as this support initiative meant students were encouraged to engage with staff individually making the experience positive and inclusive.

Overview of chapters

Previously labelled "non-traditional", our diverse students have changed the landscape of the modern university campus both in Ireland and globally. The range of initiatives showcased in the chapters of this book demonstrates the educational innovation at work in UCD to embrace this changing landscape.

In Section 1 on **Major Curriculum or Student Support Innovations** we have four highly creative projects which have clearly improved student engagement and retention.

Chapter 2, **Integrating Learning Support for Part-time Students**, outlines a successful learner-centred approach to embedding learning support which allows for flexibility and collaboration.

Chapter 3, **Navigating Semester One: A Roadmap for First Year Undergraduate Students**, gives a clear and easily adaptable model for scaffolding incoming undergraduate students who are just beginning to form their personal learner identity.

Chapter 4, **Assisting the Individual: Practical Interventions to Assist in Student Retention**, describes a project which has had huge success in retaining students who clearly stated that without this intervention they would likely have withdrawn from their programme.

Finally Chapter 5, **Facilitating Success for All Students on Placement**, outlines an approach which has ensured equality of access for nursing students on their clinical placements. This chapter will be of particular interest to any readers whose students engage in work-placement or internships – an increasingly common element in many programme areas.

In Section 2 on **Classroom Teaching and Learning Processes and Materials** there are three case studies which showcase a fundamentally student-centred approach to content and programme development.

Chapter 6, **"I'm a Busy Distance Learner" – Engage Me!**, provides a detailed look at what can be done with an online module when Universal Design is embedded from the

beginning of the design process but there are also a number of great ideas for those improving existing online material.

Good practice in online learning is also demonstrated in Chapter 7, **College Knowledge: Helping Mature Students Transition to College**. This case study gives an invaluable insight in to the creation of successful scaffolding materials – an approach which could so easily be adapted for other programme areas with great success.

Bringing this section to close, Chapter 8, **Maths Sparks: Learning Maths, Teaching Maths and Widening Participation**, showcases a successful and innovative outreach programme which not only improves the aspirations and maths knowledge of the second-level pupils who take part, but also fosters a community within the programme area and offers untold learning through teaching for the UCD students involved.

Section 3 of this book deals with **Assessment**. In this section we have three case studies which showcase innovative assessment practices which offer variety and creativity to students.

Chapter 9, **"It is really difficulty to read scientific papers" – Teach me how!**, demonstrates how development of a core skill, in this case reading a journal article, can be successfully linked to assessment.

Chapter 10, **Facilitating Students to Showcase their Research with Pride: Embedding the Presentation of Student Research into a Part-time Business Degree**, shows how successful a programme can be when skills development is built in at every level, with a sustained awareness of the needs of the student population, again linking these skills clearly to the assessment of the programme. This case study also demonstrates how students' self-perception can be bolstered through assessment which creates a community between and among students and staff.

Finally, Chapter 11, **Debating: How to Advance your Students' Communication Abilities**, focuses on transferable skills in assessment and in particular contains handouts which will be of interest to readers who are interested in using reflective writing and/or debates in their own teaching.

The last section of this book contains a list of further resources which will be of use to anyone who would like to learn more about Universal Design and how it can be applied to their own teaching and learning practices.

More case studies of Universal Design in university teaching and learning

We hope this book inspires you to revitalise your approaches to teaching and learning by adapting some of the practical ideas presented in the case studies to your own contexts. This book will have future editions so please contact the lead editor Lisa Padden (**lisa.padden@ucd.ie**) if you have ideas for further case studies to be included.

Conclusion

Universal Design provides a framework to ensure that all students have the opportunity to fulfil their educational potential. In the current climate of reduced resources, we know that Universal Design can save time for faculty during the semester and money for institutions as it can improve student engagement and ultimately retention. This book provides excellent examples of good practice and all authors give clear advice on how their initiatives can be implemented by others in Higher Education. It is easy to start small, perhaps with an inclusivity statement for your class or Department, and begin the work then of implementing other approaches such as those outlined in this book. There are a lot of strategies here to choose from and now is the time for action!

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UCD Access & Lifelong Learning: Information for Staff

UCD Teaching and Learning: Resources

Chapter 2: Integrating Learning Support for Part-time Students

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Module Name	SBUS1005D Introducing Academic Competencies SBUS1006D Developing Learning Competencies
Universal Design Principles	- Flexibility in use - Tolerance for error - A community of learners - Instructional climate
Discipline	Business
Level	UCD Level 1
College	Business
Learning Outcomes	**Learning Outcomes SBUS1005D Introducing Academic Competencies:** - Identify and develop different learning and study approaches - Effectively plan and organise your study time - Develop key note-taking skills and memory techniques - Understand and apply the key principles of essay writing - Understand how to source and evaluate material from an academic perspective - Reference according to academic conventions - Identify the important elements in planning, structuring and writing an examination answer

Introduction and context

The undertaking of a Higher Education programme is a major decision by a student. It creates a number of challenges for learners and these challenges demand the development of meta-cognitive competencies. It is important that students feel supported during their studies while they develop these academic skills. Thus the design and delivery of the support should be well considered by the institution and an appropriate approach to student skills development support identified (Wingate, 2006). In particular, the needs of part-time or distance learners may require more deliberative, planned support for students given that they are not on campus every day. Dowling and Ryan (2013) demonstrate that there is a greater likelihood for success of the implementation of academic skills where these interventions are embedded within the learner support framework. Such approaches do not need to be complex but should be learner-centred.

Why Universal Design for these modules?

This case study provides insights into the support provisions on the Diploma in Business Studies programmes. Students on this programme are mature students, returning to study on a part-time basis.

Figure 1: BBS classroom discussion on business ethics

The programme has developed a set of supports for this student cohort which are premised on **Flexibility in use** and building a **Community of learners**. Students on this programme are provided with a dedicated Learning Support Officer (LSO) who acts as a single point of contact for all academic and administrative queries. This allows the student to build a rapport with a single person. The Learning Support Officer is very accessible to the student (See below), demonstrating the Universal Design principle of **Flexibility in use**. The LSO also develops and delivers a suite of academic skills modules which supports the student. Approximately 80 students commence the programme each academic year.

Figure 2: BBS Student Classroom

Design and implementation of the initiative

The students on this programme are mature students, returning to Higher Education. For many of them the return to education is an anxious period. The classroom experience is complimented by the provision of the academic skills modules in each semester of year 1 and support by the Learning Support Officer.

In addition to the classroom experience and the opportunity to draw on their experiential learning, it is recognised that students need support to navigate the institutional terrain as well as the academic terrain. Students will have queries from the receipt of a student card, to the payment of fees to the actual development of academic skills. For most new students this involves a steep learning curve and encounters with a variety of university staff. The energy invested in this is possibly magnified for part-time students who are not on campus on a regular basis.

The intention of the Centre for Distance Learning was to develop a holistic approach to student support, whereby each student had a single key contact within the university who would be able to support them academically and operationally. Given students are not on campus every day, the opportunity to have a key liaison adds greatly to the student experience and feelings of engagement. Mindful of the supports required by part-time mature students, an appropriate structure has been developed to support students on this programme. The concept was to have an access point to the university for all queries and, if needed, a referral could be made to other university services, allowing **Tolerance for error**. Central to the success of the programme is the Learning Support Officer. Students on this programme are provided with a dedicated Learning Support Officer who acts as a single point of contact for all academic and administrative queries. The ratio is approximately 10-150 students to one Learning Support Officer.

In order to build a rapport with the student and university regarding assignments, exam technique, study approach or sourcing of suitable academic resources can be addressed by the Learning Support Officer

and a response provided within 24 hours. In each semester, a phone call is initiated by the Learning Support Officer to ask how a student's studies are progressing and answer any questions they might have. This helps to engage students demonstrate that there is meaningful support available to them during their studies. The Learning Support Officer is available to students during their block release weekend e.g. as they sign in for class, at their lunchtimes, etc. Equally, they have an active role in fostering a **Community of learners**, by organising an open coffee for all students in a class, or a networking event in each semester. This is intended to foster the relationships amongst those in the class themselves.

The relationship with the student starts with the application. Unlike other applications to the College of Business, the Learning Support Officer receives all queries to the programme and assesses the applications. Where interviews are required, the Learning Support Officer undertakes the interviews. This allows for a rapport to be developed at the first point of contact with UCD. It also means the Learning Support Officer is well placed to design and deliver the orientation programme for the Year 1 cohort, having met most, if not all, of the incoming Year 1 students. This allows for the execution of a positive **Instructional climate**. The climate is welcoming and inclusive and the concerns expressed by incoming students during the recruitment process are addressed at this early stage.

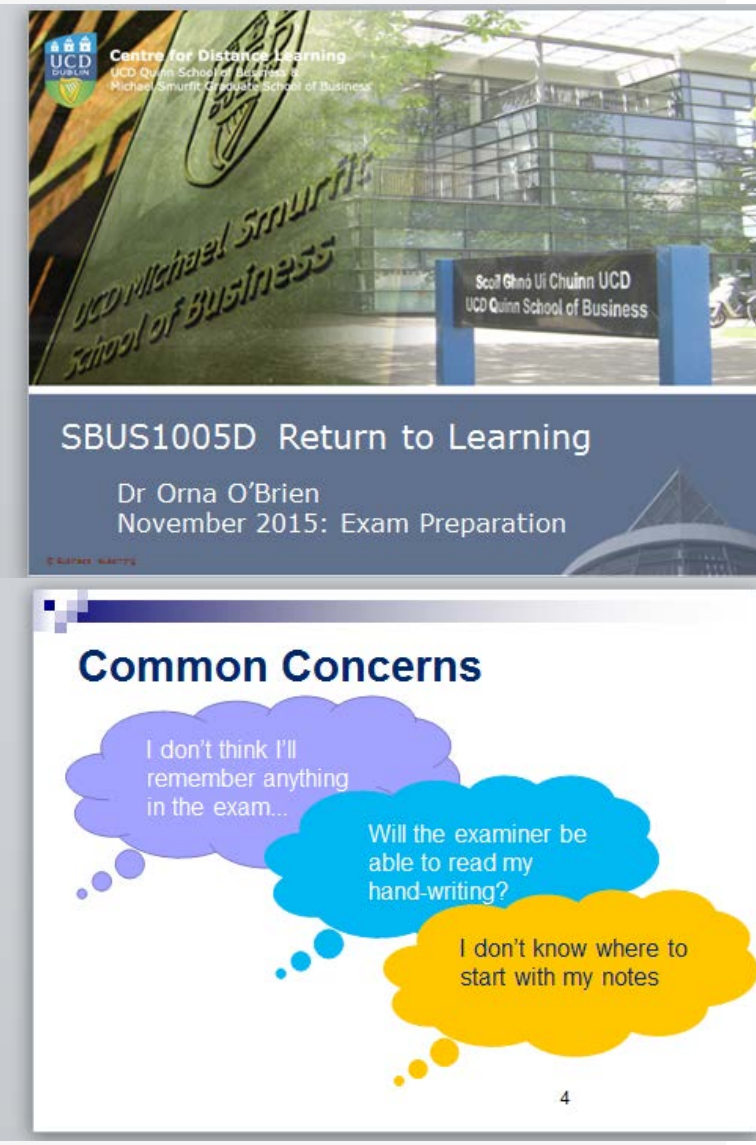

Figure 3: Sample of resources from Introducing Academic Competencies session on examination technique

Returning to Learning: Academic Competencies (SBUS1005D)

TABLE OF CONTENTS

Figure 4: Sample of study guide index for SBUS1005D Introducing Academic Competencies

As well as the day-to-day academic and administrative supports, the Learning Support Officer also develops and delivers a suite of academic skills modules which support the students, as shown in figure 3. An insight into one of these modules is provided below in Figure 4. This is critical to the support and engagement of year 1 students. These 5 ECTS modules provide the students with the essential tools to support their return to learning. The modules are assessed with practical assignments which support the students' learning and allow for meaningful feedback. For example, if the students are undertaking the module HRM1010D People Management, the assignment for SBUS1005D might be to prepare an essay plan, essay and reference list. This ensures the academic skills modules are deeply embedded into the curriculum and allows module coordinators to work closely with Learning Support Officers to reinforce key messages. The Learning Support Officers assess and prepare the feedback for these academic skills modules for the students. This is a further means to reach out to the students and to help them to develop their academic skillset.

The Learning Support Office actively monitors a student's progress across all their modules in addition to the academic skills modules, and is thus well placed to offer any additional academic support identified. The curricular resources for all modules are reviewed by the Learning Support Officer so they are familiar with the content and the assessment. The assessment for all modules is designed in consultation with the Learning Support Officer so that the module coordinator and Learning Support Officer are working with the same messages to students. All Learning Support Officers are qualified to postgraduate level in business so they are well placed to support the students as they develop key academic skills and advise on the queries re. assessment, reading and complex concepts.

Figure 5: UCD Lochlann Quinn School

How do we know it worked?

To date, this has proven to be an effective strategy with a relatively high retention rate for this typically vulnerable cohort. The provision of such academic support ensures

that students are well supported in their studies. It provides a service available to all students on the programme. It is flexible in its provision; students can call, email or meet their Learning Support Officer. It is not complex in that the student has a clear understanding of who to go to ask questions and navigate the university environment. The presence of the Learning Support Officer and the modules they provide are embedded into the programme framework. Module coordinators and Learning Support Officers work together to provide cohesive and comprehensive information to students.

The support framework allows for the development of a **Community of learners** for the students and empowering the students to take an active role themselves in this regard. The programme staff encourage students to form study groups and actively facilitate this based on geographical location. Because they are familiar with individual students, they are often well placed to pair suitable students together for study groups. This adds not only to the educational experience of students but also the social dimension. It encourages students to develop a social network, something which is often missing for part-time students.

The high retention rate for the programme of approximately 80% suggests the framework works well. Admittedly, it is a resource intensive approach but is a clear commitment encouraging participation in Higher Education.

Advice to others for implementation

While the model is resource intensive, there are elements which may be effective for other providers. It is inherently student centred and works to address common difficulties which part-time students might experience. Some of the considerations which other practitioners might like to consider include the following:

In semester support

- The initiation of a phone call to a student in each semester.
- The inclusion of a clear orientation or academic skills module upon programme commencement which is embedded with other academic modules.
- The accessibility of programme staff to student during the times of their sessions.
- The visibility of staff inside and outside of the classroom is very important.

University infrastructure

- The strong working relationship between programme management staff and academic staff to ensure there is a cohesive programme of studies and clear programme messages.

“The support from Learning Support Officers (and the CDL team) throughout the four years made life easier – it is a challenge to complete part-time study while working, so anything that makes life a little easier is very welcome.”

“I am surprised to have received so much from these modules, I learned a lot on how to express myself using better structure, the tasks to write essay were great and challenging”

“...made life easier – it is a challenge to complete part-time study while working, so anything that makes life a little easier is very welcome”

STUDENT FEEDBACK

References & resources

Dowling, L. And Ryan O. (2013): 'The 'Build-Up' Approach to Academic Writing Skill Development: The Case for a Discipline–Driven Collaborative Design', All Ireland Journal of Teaching and Learning in Higher Education, 5 (1): 1-19

Higher Education Authority (2009): Open and Flexible Learning, HEA: Dublin

http://www.hea.ie/sites/default/files/hea_flexible_learning_paper_nov_2009.pdf

Wingate, U. (2006): 'Doing away with 'study skills', Teaching in Higher Education, 11(4): 457-69

Chapter 3: Navigating Semester One: A Roadmap for First Year Undergraduate Students

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Introduction

Like most students entering Higher Education for the first time, students entering the UCD School of Agriculture & Food Science are required to quickly negotiate the transition to University life. The School's Semester One Roadmap – referred to as The Roadmap – was developed as a simple visual representation of this transition period, thereby providing an integrated view of the complex academic, social and personal landscape encountered by new students.

In short, The Roadmap aims to support students to build on their commitment to their degree programme by highlighting points of identification and information that assist them to become familiar with the myriad educational, emotional and environmental adaptations needed to settle into university life and begin progression through their programme. The Roadmap highlights the key academic, administrative and engagement milestones within the university context and anchors them within the School calendar, thereby providing a foundation roadmap to guide students towards negotiating the transition through semester one towards a formation of their personal learner identity.

Project Name	Semester One Roadmap
Universal Design Principles	- A community of learners - Equitable use - Flexibility in use - Simple and intuitive use - Low physical effort
Discipline	Agriculture & Food Science
Level	UCD level 1
College	Health & Agricultural Sciences
Learning Outcomes	**At the end of the first semester, incoming students should be cognisant of:** - transition to university life as a period of personal discovery which differs for everyone - participation in group activities, both academic and social, as a means to build a sense of identification with and belonging to their programme over time - managing their own time and prioritising activities - achieving a balance between academic and social activities - availing of a range of experienced advice and support should academic, social and/or personal issues arise

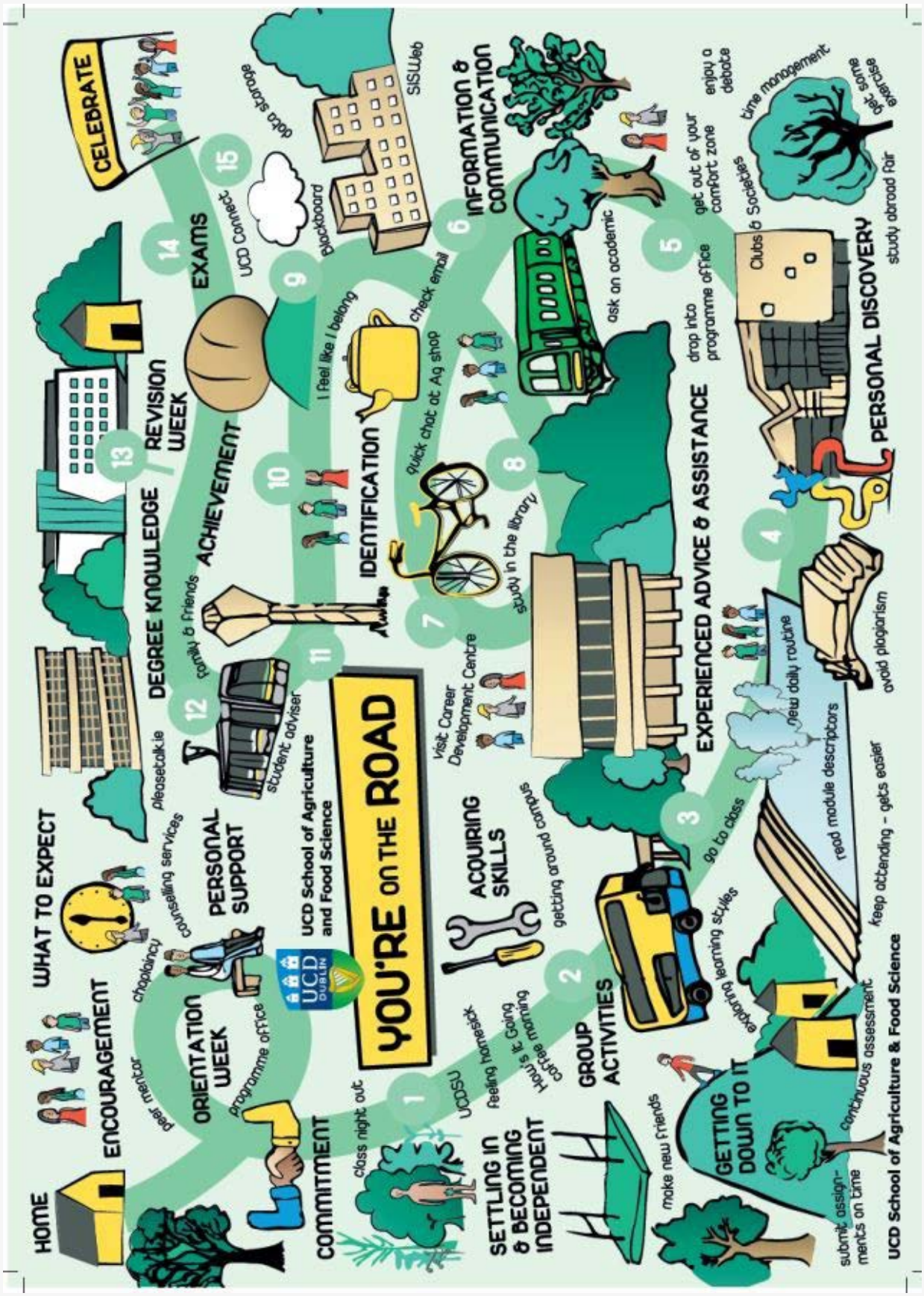

Figure 1: Front of Roadmap postcard

Figure 2: Back of Roadmap postcard

UCD School of Agriculture and Food Science
YOU'RE ON THE ROAD

ACADEMIC CONTACTS

PROGRAMME OPTION COORDINATORS
Programme Option Coordinators can provide academic information and advice on your programme Contact details are listed in the Staff Directory

DN250 Agricultural Science Omnibus
Associate Professor Alan Hunter

DN250 Animal & Crop Production
Professor John O'Doherty

DN250 Animal Science
Professor Pat Lonergan

DN250 Agricultural Systems Technology
Professor Nick Holden

DN250 Food & Agribusiness Management
Dr. David Stead

DN251 Animal Science - Equine
Dr. Barbara Murphy

DN252 Dairy Business
Dr. Karina Pierce

DN253 Agri-Environmental Sciences
Associate Professor Gordon Purvis

DN261 Food Science
Professor Jim Lyng

DN262 Human Nutrition
Dr. Breige McNulty

DN271 Forestry
Professor Maarten Nieuwenhuis

DN272 Horticulture, Landscape & Sportsturf Management
Dr. Owen Doyle

MODULE COORDINATORS
Module information including module coordinators is available at www.ucd.ie/students/course_search.htm

PROGRAMME OFFICE
www.ucd.ie/agfood/staff/programmeoffice
Agriculture & Food Science Programme Office
Room G.10 UCD Agriculture & Food Science Centre
01 716 7194
agandfoodprogrammes@ucd.ie
The Programme Office is the first point of contact for students seeking academic advice and support. They are here to help you with any concern or query relating to your degree programme. Some of the key areas they can help you with are:

- Registration queries
- Academic programme advice
- Extenuating circumstances / medical certificates
- Withdrawal / re-admission
- Referral to student advisers, academic staff, Access Centre and Disability Support
- Study abroad

If they can't help you they'll point you in the direction of someone who can.

STUDENT ADVISERS
www.ucd.ie/studentadvisers
Naoimh O'Regan
Room 2.48
UCD Agriculture & Food Science Centre 01 716 6085
naoimh.oregan@ucd.ie
Student advisers provide support for all students but particularly first year. They are here to help you make your time at UCD as fulfilling as possible. You can call to see them in relation to personal, social or practical issues. From simple requests for information to more confidential and serious matter, Student Advisers will give you the time and space to talk things through.

STUDENT DESK
www.ucd.ie/studentdesk
Ground Floor Tierney Building 01 716 1555
www.ucd.ie/studentdesk/contact
SISWEB access, fees and form stamping are just some of the services provided. You can also get official documents such as Certificates of Attendance, Statements, and Official Transcripts online via your SISWEB account, under the Registration, Fees & Assessment tab.

ACCESS CENTRE – DISABILITY SUPPORT
www.ucd.ie/openingworlds/disability
Level One James Joyce Library Building 01 716 7565
accesscentre@ucd.ie
The UCD Access Centre provides a range of support for students with disabilities.

STUDENTS' UNION
www.ucdsu.ie
As a UCD student you automatically become a member of the Students' Union

UCD STUDENT CHARTER
www.ucd.ie/studentcharter
The Student Charter sets out the roles and responsibilities of the various groups within the University and outlines what you can expect from the University and what the University can expect from its student members.

UCD STUDENT CODE
The Student Code establishes the University's expectations in respect of student behaviour and conduct.

UCD STUDENT EMAIL PROTOCOL
Remember to check your UCD email account frequently so that you don't miss out on important information from the University. We use your UCD email address for all official communication with you.

UCD ACADEMIC REGULATIONS
Your studies in UCD are governed by a set of overarching rules called Academic Regulations. These regulations are supported by academic policy, procedures and guidelines. For ease of use, there is also a quick reference user's guide to the regulations available which allow you to search for topics in an FAQ format.

UCD EXAM REGULATIONS
UCD has examination procedures and regulations in place so make sure that you are aware of the rules.

UCD SMOKE-FREE CAMPUS POLICY
A smoke-free campus policy is being implemented in UCD. Phase 1 started in September 2015 with the introduction of smoke-free zones within 10 metres of all entrances to building and in prescribed areas.
You will find a copy of these regulations in the Student Services Directory on the Current Students areas of the website, under University Regulations
www.ucd.ie/students

Design & implementation

The Roadmap Project was initiated by the School's Orientation, Support & Retention Committee with the support of a Teaching & Learning Support Grant from the School. Long before the project got off the ground I'd made a draft sketch of a Roadmap - my vision was similar to the landscape of a Ordnance Survey Discovery map with high and low ground and other physical features representing the opportunities and challenges around student transition. Around the time of the School's call for T&L grant applications, I also noticed that AIB had installed a colourful animated campus map in a light-box along one wall of their Belfield branch. My ideas and observations - the landscape and its topography, the milestones along the transition road and the animation - all came together when designing The Roadmap. The grant proposal included the identification of Briggs as a suitable theoretical model. Overall, the project comprised the following steps:

1. Identification of theoretical model
2. Scope out content and customise
3. Artwork design
4. Implementation

Collaboration of staff and students was required for development, implementation, promotion and active engagement with The Roadmap.

STEP 1: Identification of theoretical model

The starting point of The Roadmap was to recognise that first-year orientation is a semester-long activity and that student influences extend well beyond the limits of the School and university campus. This extended concept of a transition to university life that includes non-organisational influences is represented by Briggs' "Model of organisational influence on the development of learner identity" (Figure 1) and formed the basis for development of the design.

STEP 2: Scope out content & customise

The development team led by the Programme Manager (Irene Rose) comprised current and postgraduate students as well of School and Programme Office support staff including Naoimh O'Regan (student adviser), Tara Walsh (Marketing & Student Recruitment Officer) and Dr Eileen Gibney (Associate Dean – Teaching & Learning). The collaborative online tool Mindmeister enabled real-time sharing and development of the map across a dispersed project team (Fig 2).

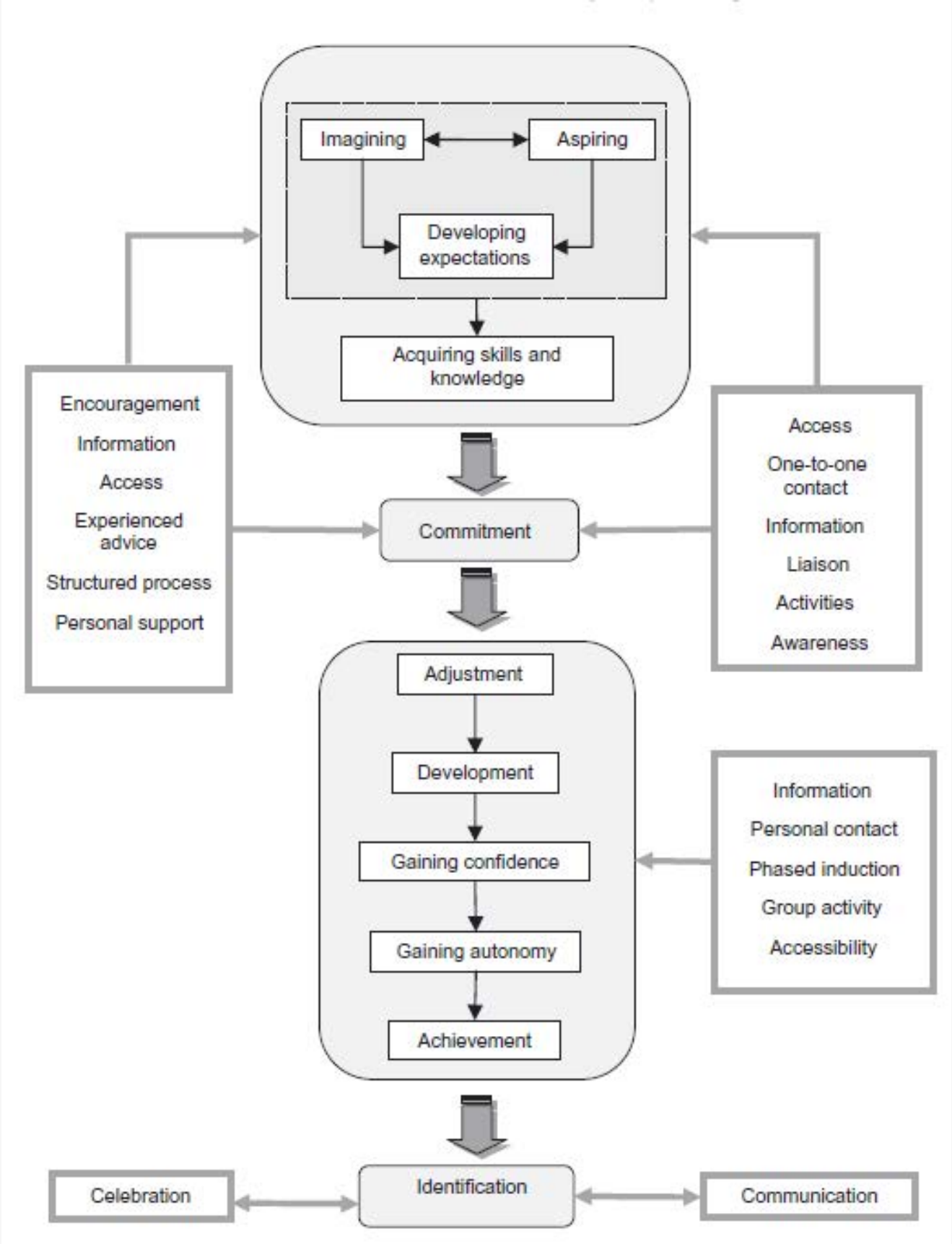

Figure 3: Brigg's Model of organisational influence on the development of learner identity

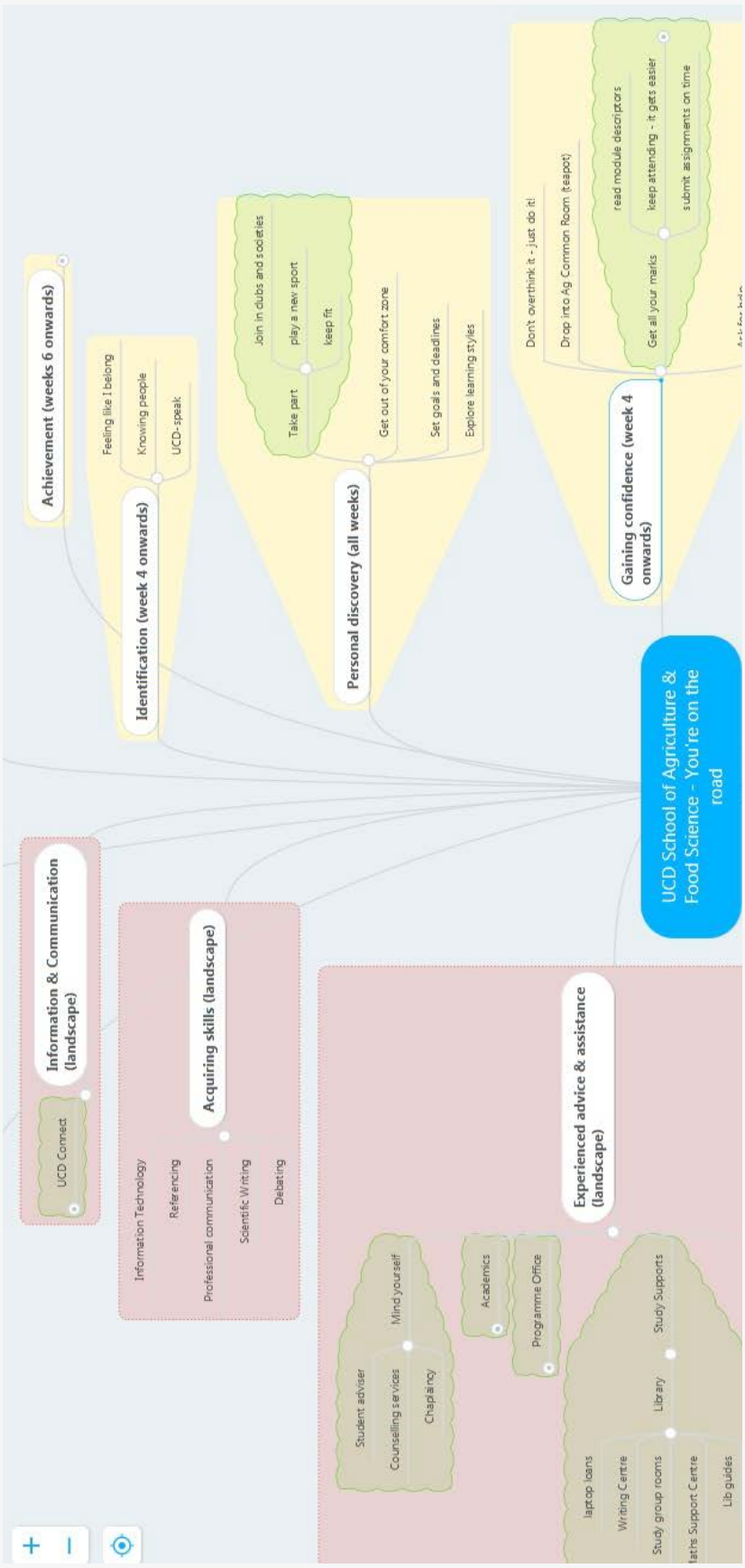

Figure 4: Development of Roadmap content using Mindmeister

One student member of the development team noted, "I hadn't used a mindmap in a collaborative way before. It helped me to see how I could use mindmaps this way in future".

The group worked to identify words, phrases and images commonly associated with each step in Brigg's model. Insights gained provided student-centred content, which was arranged along a 'Road' of a draft Roadmap. Through this approach, it became clear that while many of Brigg's terms were easily recognised by students, others were less well understood. e.g., while 'commitment' was a well understood and accepted term, 'development', 'gaining confidence' and 'gaining autonomy' steps were less familiar and the term 'Personal Discovery' was settled upon as a way of framing the process of change experienced by students.

STEP 3: Artwork design

The services of a graphic designer were engaged to develop the artwork along Universal Design principles. This step was undertaken using a phased approach that allowed the designer and development team time to:

- understand project requirements and seek clarification where necessary
- create ideas for the School's consideration
- deliver drafts for the School's feedback,
- make subsequent revisions as required

Aspects of Universal Design

The Universal Design aspects of The Roadmap allow it to be quickly grasped by a broad and diverse cohort. From the outset, The Roadmap was envisaged as a visual interface incorporating the use of colourful imagery interspersed with key words and phrases to depict a landscape packed with recognisable features as well as unfamiliar ones encountered by students during transition in a **Simple and intuitive** way. The tangible weight of the card and the colourful imagery make it both durable and attractive. The visual appeal engages students who can easily recognise aspects of the complex academic, social and personal landscape they are entering.

A 'Road', which begins at 'Home' and ends at 'Celebrate', twists and turns through the landscape and allows students to locate the various features and reflect on their personal progress with **Low physical effort**. The logo You're on the Road emphasises the often indirect yet progressive nature of transition to third-level learning.

While the topography is localised to the School and aimed primarily at transitioning students, it can be also accessed by other students as well as staff, making for **Equitable use** across the School and the wider university.

The scalable layout accommodates **Flexibility in use**, which include A5 postcards, populated on the reverse with academic and support contact information. Other versions were created for multi-sized posters and slides and a pop-up stand. In addition to the visual form, a weekly email is sent from the School's Associate Dean of Teaching & Learning to all first-year students plus staff, thus recognising a **Community of learners** within the School.

STEP 4: Implementation

The Roadmap launch began in Orientation week 2016/17 with A5 postcards distributed to all incoming undergraduates at the Academic Advisory sessions on the first day of Orientation. This includes CAO, international and mature entrants to all the School's programmes regardless of their entry-path and duration of their stay.

During Orientation week, posters, slides and a pop-up stand of The Roadmap of displayed throughout the UCD Agriculture & Food Science Centre, creating a familiar backdrop within their new programme 'home'. These initiatives are supported by posts on social media.

Throughout the semester an encouraging email is sent out weekly, bringing attention to the features on The Roadmap that are of a timely and relevant nature and bringing students' attention to opportunities and their achievements and progression throughout the semester, while simultaneously sending out reassurances of available experienced advice and support.

Figure 5: Students at the How's It Going Coffee Morning

Communications continue throughout the semester with on-going posts on social media, emails, poster and plasma displays as well as further copies of the A5 postcard circulated at featured School events such as the 'How's It Going Coffee Morning' - a first-year gathering held in the student common room, aimed to aid students growing in confidence and autonomy to mix

with students in later stages, as well as staff from service and support units such as the Programme Office, Library, Maths Support Centre, Writing Centre and Student Advisors. A total of 750 A5 postcards were distributed. Half of these were given directly to students during Orientation week with the remaining half disseminated to staff and students either at on-going Orientation events such as the How's It Going Coffee Morning or by collection from the Programme Office.

Results & findings

The Roadmap is a long-term project that aims to build student awareness from the outset of their degree and ultimately transform this awareness into positive action that leads to rewarding and fulfilling experiences during their programme. Such a holistic vision for student's expectations of university life and the potential for engagement across many aspects of the academic, social and personal landscape makes quantitative evidence of impact hard to quantify.

What can be said of The Roadmap is that it highlights the potential aspects of the student experience which expand and complement curricula learning outcomes. One example of this is student debating within the School, brought to the attention of incoming students in week five.

Debating

Debating meets many of the learning outcomes in the personal development and transferable skills arenas, as outlined in a flyer distributed to promote debating in the School. It is also an opportunity for students and staff to join in a learning activity beyond the classroom that is both enjoyable and educational for students, while being insightful and entertaining for staff. The collaboration of students and School has the effect of attracting students who may have experience of debating at second-level and wish to build on their experience, as well as those who recognise the benefits of debating to their future aspirations. This combination of experience and enthusiasm contributed to:

- the establishment of a new 'AgSoc Debate Series'
- the inclusion of a debate into AgSoc's AgWeek calendar of activities
- the School team win of the 2017 Great Agri-Food Debate trophy against Waterford Institute of Technology
- a stage one student taking the Great Agri-Food Debate 'Best speaker' award

In this example, The Roadmap aided contextualisation of a collaborative staff-student initiative within the broader student experience and contributed to a **Community of learners.**

WHY GO TO A DEBATE?

Debating is verbal sport worthy of the Olympics, an activity full of high speed action where a single second cannot be wasted. Debaters develop analytical, critical and quick thinking, persuasive speaking, note-taking, speed reading, and in-depth research skills, which look fantastic on any application form or CV. They also learn essential life skills, like winning arguments. It's also great craic!

By debating you develop qualities that help you at work and at play, such as:

- **Persuasive communication.** Be shy no more! Debaters learn to stand up in front of any audience, thereby increasing speaking abilities and leading to more persuasive and relaxed communication.
- **Teamwork.** Cooperation is a golden rule in debate. Not a single tournament is won without the help of the team. Everyone must play their part in order for the team to win.
- **Focus.** A noisy heckling debate can get stressful. Debaters learn to filter and focus on what is being said.
- **Quick and critical thinking.** Put under time pressure, debaters learn to think of good arguments and loop holes in evidence in an abnormally short amount of time.
- **Organization skills.** Debaters learn to prepare and get organized so they don't get hassled.
- **Research.** Debaters have to find facts, figures and other information to support their arguments. With the pressure under time, a debater must skim or read quickly to get through potential evidence for or against an argument
- **Fast and accurate note-taking.** Rapid speaking in debates requires rapid note-taking.
- **Knowledge of the real world.** Current international, national, & local events, politics, new foreign policies, government, economy, science, health & other exciting topics are constantly researched for evidence to support their arguments. Debaters learn to see and understand the world both subjectively and objectively.

Finally, joining in a debate involves meeting people with many interests, opening up understanding and leading to potential opportunities in unfamiliar walks of life. So, join in the craic. What's not a good reason to go to a debate?

Figure 6: Debating Flyer

Feedback

Social media

Communications on social media reached almost three thousand Twitter users and over one thousand Facebook users. Comments, likes, shares and retweets showed a positive response to The Roadmap as detailed below.

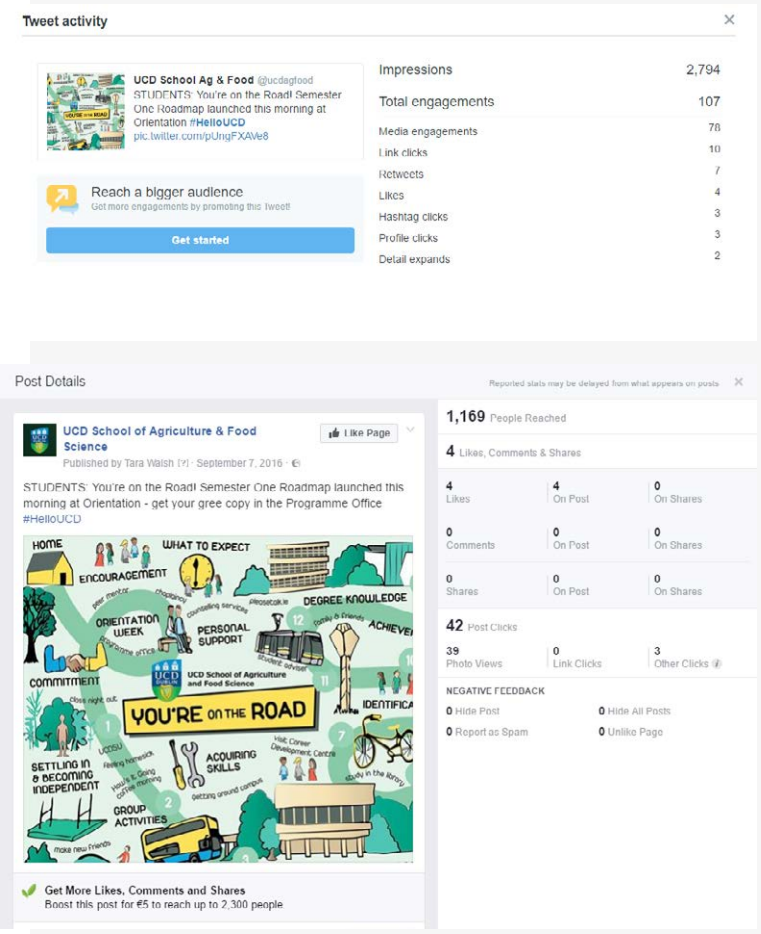

Figure 7: Twitter and Facebook activity following launch of The Roadmap

Student responses

- The number of weekly Roadmap emails opened by stage one students ranged from 81.5% to 90.6%. On average 85.5% of students opened The Roadmap emails.
- Participants at a focus group of later stage students (predominantly stage four) held by the School's Student Engagement Committee at the start of semester two indicated strong identification with The Roadmap. Participants indicated that it brought attention to opportunities they had not been aware of at earlier stages in their programme, such as study abroad, the Career Development Centre and debating. Similarly, time management and exploring learning styles were regarded as skills with a cumulative effect, most benefiting students who adopted them early and continued to practise them throughout their degree. Comments included: "The Roadmap shows exactly what it's like being an Agriculture student" – 4th year Agriculture student.

"A request has been made by to include The Roadmap as a case study in this Universal Design in Education Handbook, as it was thought it, "would make a great addition... which all students would benefit from."

– Dr Lisa Padden, Academic Skills Coordinator, UCD Access & Lifelong Learning.

"The Roadmap was brought to the UCD Widening Participation Committee, where it was met with interest as an example of fostering participation and engagement that, "supports student learning at University, whether it be personal development, formal classroom learning or [wider] learning in societies."

- Associate Professor Mary Forrest, UCD School of Agriculture & Food Science

"The Roadmap is a great idea well executed. Well done."

– Assistant Professor Nigel Brunton, UCD School of Agriculture & Food Science

"a great initiative and one that could be easily adopted to great benefit by other parts of the University."

– Professor Grace Mulcahy, UCD School of Veterinary Medicine

"well done on the map, it looks fantastic!"

– Tara Walsh, Marketing & Student Recruitment Officer

Implementation advice

Ensuring The Roadmap speaks to students in both a visual and verbal way required the participation of programme-specific students, academics and support staff. Implementing Universal Design did not mean having to compromise on localised content. The time required to capture and reflect on relevant content took several drafts; as we initially had more content then space available on the A5 postcard, choices had to made between words and images that students could recognise at the start of the semester such as 'peer mentor' and those that were local to UCD or their programme such as 'How's It Going Coffee Morning', which students would come to learn during the semester.

It was important for us to have some continuity between the School's marketing and promotional materials and The Roadmap. Providing the designer with a clear picture of our vision of the landscape (e.g. colour, topography, mood) saved time and money. To stop the project over-running, a number of design steps and working contract were agreed with the graphic designer at the outset of the design step. These included agreeing the allocation and placement of space for each of Brigg's localised model, a specific number of drafts, artwork deliverables and sign-off criteria.

Further development

Consideration to developing The Roadmap for stage two in 2017/18 would allow the School to focus on the links between early and later stages of the degree, and set out how degree knowledge develops over the programme duration.

References

Briggs, A.R.J., Clark, J., & Hall, I. (2012). 'Building bridges: understanding student transition to university'. Quality in Higher Education, 04/2012, 18(1), 3-21.

Chapter 4: Assisting the Individual: Practical Interventions to Assist in Student Retention

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Dr Paul Rouse
Lecturer
UCD School of History
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Introduction and context

Student engagement can be challenging in a large programme such as Arts. The School of History has run a pilot scheme designed to reduce the number of students who fail or drop out of history modules. The Scheme commenced in January 2015 and operated through the second semester of the 2014/15 academic year. It then ran through both semesters of the 2015/16 academic year. The ambition of the School of History Student Support Scheme is to reduce the number of students who fail or drop out of history modules.

Why Universal Design for this initiative?

Comment has already been made in other forums on the challenges surrounding the BA programme (and in all large university programmes), on the alienation experienced by some students who struggle to settle and adapt. At the core of this challenge is the anonymous nature of the experience of students, particularly in First Year (Tinto, 2012). Changing this experience is essential. All of these points are supported by the evidence that has emerged in the early operation of this Scheme. Indeed, the Scheme is designed precisely to combat such problems.

Initiative	School of History Student Support Scheme
Universal Design Principles	- Tolerance for error - Instructional climate - Simple and intuitive
Discipline	History
Level	UCD levels 1 and 2
College	Arts and Social Sciences
Learning Outcomes	**The ambition of the School of History Student Support Scheme is to reduce the number of students who fail or drop out of history modules. The Scheme seeks to achieve this ambition by:** - Providing practical assistance to students of history who fail modules - Offering students support in understanding and undertaking the repeat/re-sit process - Assisting students to develop the skills which will enable them to avoid further failures - Examining the reasons why students fail modules - Providing students struggling with history modules with a central and definite point of contact where they can seek assistance - Identifying measures that might be introduced across history modules to improve student learning

“

On the advice of a professor of history, I made an appointment with Leanne Blaney. I found this first contact quite relaxing and **very comfortable**. The reason I attended the writing academy was to understand more fully the bibliography and footnoting properly. I found Leanne quite enjoyable to work with and her work **provided some vital tools** for me going forward. For me being a first year student I found Leanne and her work especially crucial in getting a foothold on the academic requirements of UCD.

The **transition is difficult** enough and I feel that the service provided by Leanne is essential, especially first years, as it provides a guide to knowing what is needed to progress. I only regret that I did not utilize the opportunity sooner. Looking forward to the next semester, I hopefully will not need the service of Leanne and her colleagues but I am supremely **confident that I will get the support** that I need to maintain a high GPA.

”

1ST YEAR HISTORY STUDENT

Design and implementation

The Scheme is rooted in offering practical support to students. Its methodology is **Simple and intuitive**. It seeks to identify students who need assistance, contact those students, meet them, assist them with their particular problems, and guide them through the repeat/re-sit process. Across the three semesters in question, the following broad measures were undertaken.

1. Identifying students

Students were identified through two methods. Firstly, analysis of end-of-term semester results identified the students who failed modules and how they had failed them. This was achieved through tabulation of their grades (composed of Attendance, Mid-term assignment and End of term assignment/examination). Secondly, during the semesters students were recommended to avail of the Scheme by teaching members of the School of History. Usually these were staff members who had met or corresponded with the students on an individual basis and believed that they would benefit from the Support Scheme. Their details were then passed onto the Special Teaching Fellow, Leanne Blaney[1].

2. Contacting students

The operation of the scheme centred on establishing and maintaining direct contact with students who had failed to complete history modules. The first contact was by email, with students advised on the practical steps they needed to take to pass the module. If a student failed to respond to the email, failed to register to repeat, or failed to sign out the re-sit essay title set for each particular module, they were contacted by phone. Again, every student was offered advice and encouragement to engage with the assistance on offer.

3. Meeting students

The first meeting with the student who had failed a module usually occurred within the first two weeks of semester. It provided students with an opportunity to meet the Special Teaching Fellow and an opportunity to explain why they felt they had failed the module. The Special Teaching Fellow used these initial meetings to identify whether the student required writing and academic support, or pastoral care.

Depending on the outcome, students either continued to work with the Special Teaching Fellow or were transferred to receive Paul Rouse's assistance. All first year students (and almost all second year students) then returned for a second meeting to discuss their essay plans. Throughout the semester students regularly availed of the drop-in service which operated on Wednesdays in K115 and K118, while those who required

[1]Dr. Brian Casey was also involved as a support teacher in the first semester of the Scheme.

additional meetings usually scheduled them via email or phone call. All contacts built on creating a positive and welcoming **Instructional climate**.

4. Writing and academic support

Writing and academic support formed the basis of the Scheme. Others needed assistance with issues such as time management, essay planning and structure. The workshops and one-to-one tuition offered by the UCD Writing Centre has proven hugely successful and the History Student Support Scheme has sought to work in tandem with the Scheme. In this regard, history students have noted the importance of receiving additional support in acquiring the particular analytical and written skills which studying third-level history requires.

5. Pastoral care

A key aspect of the Scheme is the manner in which issues relating to the pastoral care of students are revealed in the course of one-to-one meetings. These issues have ranged from depression and other health-related matters to family and relationship breakdown. On other occasions, the transition to university has overwhelmed students who require advice and assistance in meeting the demands of a new environment. All pastoral care matters are dealt with by Paul Rouse (as a full-time member of staff) and, where necessary, referral to the appropriate support services is undertaken.

How do we know it worked?

The Support Scheme has managed to increase both registration and submission rates for history students who fail modules, and has increased the number of students successfully completing repeat/re-sit modules as the scheme allows **Tolerance for error**.

First year students

In 2015 all 67 first year students registered to re-sit first-year history modules in semester two had been contacted and met by the Scheme's mentors prior to their registration. Throughout the semester all 67 students (plus the students enrolled in semester two modules who were referred to the Scheme by members of staff) regularly met or were in contact with their mentor.

In 2016, 40 students registered to re-sit first-year history modules in semester two and throughout the semester all students regularly met or were in contact with the Teaching Support Fellow. The submission and success rates each year are significantly higher than the years before the Scheme started as shown in the chart below.

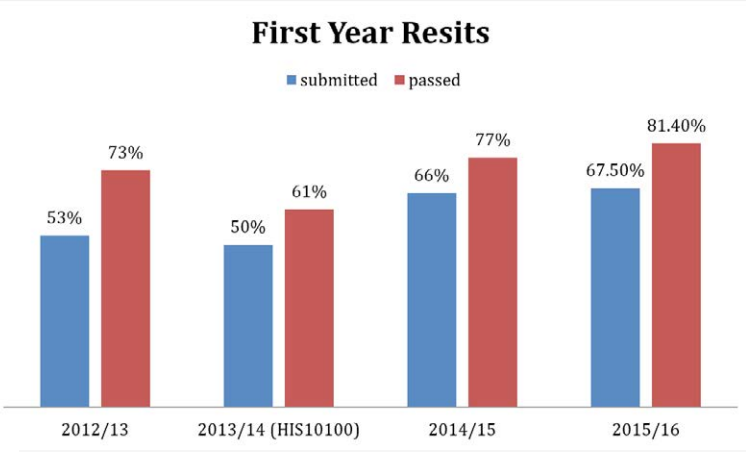

Figure 1: First Year Re-sits

Feedback from members of staff who assessed the re-sits also suggest that the submitted re-sits were of a higher standard and were submitted earlier than in previous years.

Second year students – Registering, submitting and Passing re-sits

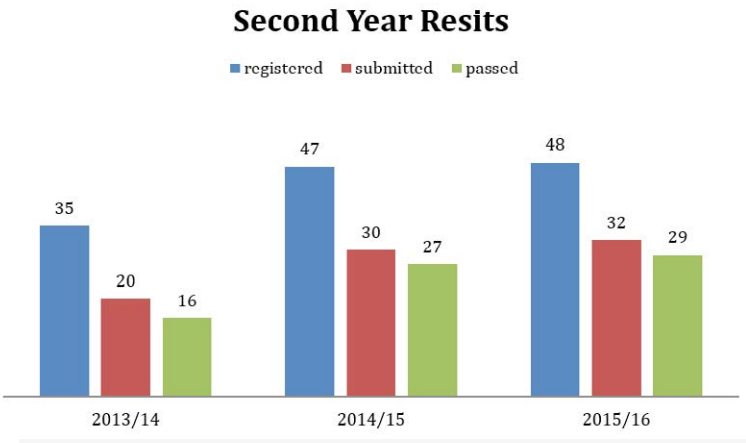

Figure 2: Second Year Re-sits

The change in curriculum design renders comparison with other years more difficult, but it is clear that for Level Two students also the support system has proved to be beneficial. This is supported by student testimony shown later in this case study.

Making the Scheme work – issues to consider

At this junction, it is worth underlining a number of issues of wider significance. These issues involve non-attendance at seminars, non-submission of course work, and the timing and nature of repeat examinations.

Responding to absenteeism

It is apparent that the single most important issue underlying student failure in history modules is absence from class. Those students who do not attend class invariably fail to complete course work and then, in turn, invariably fail the module. In response to the results of the Scheme, the School has introduced a new protocol for all first year courses in respect of identifying and assisting those students who are struggling to complete course work, and in impressing on every student the imperative of attending class. As a result there has been a dramatic reduction in the number of students failing to achieve an attendance grade (awarded after the student attends 6 mandatory seminars) as shown in the tables below.

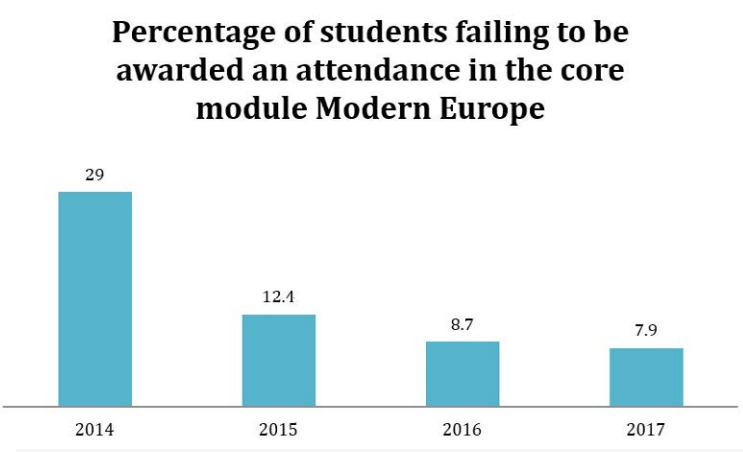

Figure 3: Students not receiving attendance mark for Modern Europe module

In response to the working of the Scheme, the School of History introduced a new protocol for all first year courses in respect of identifying and assisting those students who are struggling to complete course work, and in impressing on every student the imperative of submitting course work in full. At least in some measure because of this, there has been a significant increase in the number of midterms submitted across all modules offered in Level 1 and Level 2.

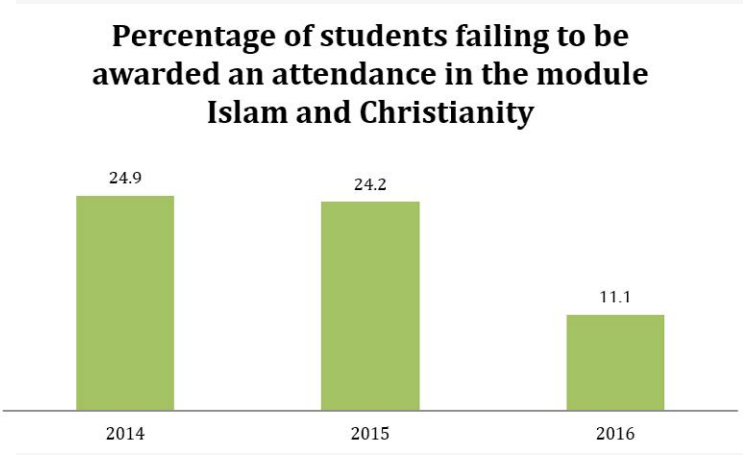

Figure 4: Students not receiving attendance mark for Islam and Christianity module

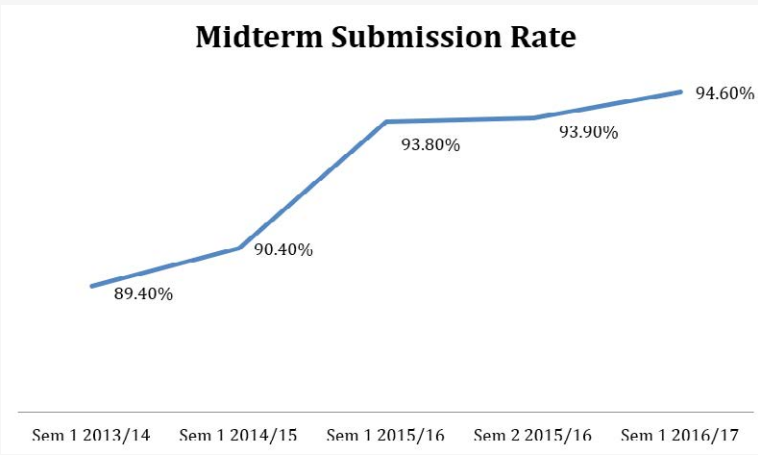

Figure 5: Midterm submission rate

The challenges of continuous assessment

The challenges posed by continuous assessment are particularly apparent among the cohort of students who perform well in end-of-semester examinations but who have not fulfilled the basic requirements in respect of course work. It is essentially impossible to pass a history module if no course work has been submitted.

The repeats process

The process of repeating and re-sitting modules in history is unsatisfactory. The simple fact is that the nature of the repeats process places an additional burden on students who are already failing. There are many instances where this has led to students carrying multiple failed modules, usually on top of new modules which they are undertaking.

The result is students trapped in a cycle of failure, often ending in ultimate withdrawal from the programme. Students admitted to university should be able to access supports to help them to succeed and institutions have a responsibility to provide this support (Tinto, 2012). It is a matter of considerable importance than the repeats system be overhauled and that a new structure be put in place.

Advice to others for implementation

1. The History Student Support Scheme is dependent on the commitment of a significant number of hours and a clear understanding of the particular needs of each individual student.
2. It is essential to the operation of the Scheme that a full-time academic member of staff take on the responsibility of dealing with all pastoral care issues.
3. Except in exceptional circumstances, the Student Support Scheme now seeks to contact students solely through email.
4. The cost of the Scheme in Semester Two of the 2014-15 academic year was €2,120. The cost for the 2015-16 academic year was €5,000.
5. Having a set drop-in time for students has proved extremely useful.

“

I had occasion to use the Pastoral initiative because I failed my Irish History module in my first semester. I was contacted by Leanne and she explained how I could do a re-sit in Essay form. I was most grateful to her for all the help she gave me, I found her to be extremely supportive, always keeping in touch with me and providing me with comments on my final draft which was invaluable in my opinion. I would have no hesitation in recommending anyone to use this Pastoral initiative; it is wonderful to have such help especially in the first year – 1st Year Arts

I also just wanted to say thank you so much for your understanding this semester... It really made me feel like UCD had a personal side rather than just churning out students! - 2nd Year History

STUDENTS

“

The aim of the re-sit, in my opinion is not to necessarily punish the student but instead to give them guidance and advice to ensure the student gets the ‘leg up’ needed, the re-sit I did fulfilled this. Prior to the re-sit I was negative towards and lacked confidence in my essay writing. I often would second guess my work leaving it jumbled and lacking direction. I met with Dr Casey frequently as well corresponding in emails. He ensured I managed the essay on many different levels, time wise, content wise as well as ensuring I understood the complex issues surrounding the subject I was writing. The work Dr Casey did with me has had a profound and great impact not only on my history major but also on my other major, geography. Though it wasn’t an easy experience the re-sit was necessary - 2nd Year History

STUDENTS

“

At the start of the year, I found myself over my head in college work, and some ongoing personal issues. At times I was thinking about dropping out, the workload just seemed impossible, but the Pastoral initiative was a literal lifesaver. Being able to talk shop with someone about the work, helping me to break it down into smaller and more manageable parts, it was exactly the kind of help I needed. I could not recommend this more to any student feeling they’re struggling – 3rd Year Arts.

I found myself involved in the Pastoral initiative as a result of failing a History module, and I found it extremely helpful. It has given me a lot more confidence with essay writing. At 3,000 words, the re-sit assignment was a bit longer and more daunting than the average first year essay, but the help and guidance I received from my tutor made the whole experience a lot easier and more straightforward. I’d strongly recommend the initiative to anyone who finds themselves in a similar situation - 1st Year Arts.

STUDENTS

“

For me the start of semester two was a bit of a disaster, I had failed a few modules after a very difficult first semester and I was dreading even heading back to college after Christmas. When I first received an email regarding pastoral initiative I hadn’t a clue what to expect and to be honest I was nervous about going up to the school to discuss in person why I had failed so many modules... Hopefully I won’t be needing it again but it might help a student that was considering dropping out as I was and I would hope that it be available to students in the future. UCD can be a bit overwhelming for students and it was nice to have someone there to look out for you over the semester - 1st Year Arts.

“

I found it to be really helpful as it gave me a clear idea of what I had to do after the first semester. I failed nearly all of my modules and nearly considered dropping out a few times so I could redo first year in the new year. My tutor really helped me realise that there was still a lot I could do to finish my first year strongly and progress to second year by putting effort into my re-sits. My tutor was particularly helpful because she made sure I never forgot that there was still a lot that was under my control, as regards progression to second year. I would definitely recommend the initiative to other students - 1st Year Arts.

“

The only reason I completed my re-sits was through this initiative. I failed because I had a bereavement in my family and also suffered from a lot of financial problems after, so I was in and out of college the majority of my first year. I didn’t seek any help myself and didn’t really know who to go to, however, in second year I was immediately assigned my tutor and met up with her for a one-to-one chat. I constantly benefited from this initiative as I lacked a lot of confidence with history particularly with my writing abilities, and the tutor helped to eliminate these confidence issues by giving me advice on what was needed for the essay and by regularly emailing and checking up on me... My tutor was the intervention which I needed and I am extremely grateful to have been given the means to enable me to complete my first year and progress within UCD

- 2nd Year Arts.

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Tinto, Vincent. Completing college: Rethinking institutional action. University of Chicago Press, 2012.

Chapter 5: Facilitating Success for All Students on Placement

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Introduction and context

All student nurses deserve to be set up for success on placement. Over the early years, committee members observed that students with a disability may require additional supports in the way of Reasonable Accommodations to achieve clinical competence. UCD Access & Lifelong Learning provides students with academic and examination support for the theoretical components of the programme, but the supports for students with a disability in clinical practice were ad hoc and sporadic, in particular, during internship. In response, a Disability Liaison Team (DLT) was created to expand on the supports already offered by UCD Access & Lifelong Learning and the Association for Higher Education Access and Disabilities (AHEAD) in the clinical area. The team's main responsibilities were to review, develop and implement innovative support practices for students with a disability in the clinical practice area.

Initiative Name	Promoting Inclusive Learning Environments and Providing Reasonable Accommodations for Nursing and Midwifery Students on Work Placements
Universal Design Principles	- Equitable use - Flexibility in use - Simple and intuitive - Instructional climate
Discipline	Nursing and Midwifery
Level	UCD levels 1-4
College	Health and Agricultural Sciences
Learning Outcomes	- To implement best practices to support the success of students with disabilities. - To embrace current legislation that encourages the promotion and full participation of individuals with disabilities. - To understand the operationalising rights and responsibilities of students, academic and clinical staff in relation to promoting inclusivity amongst students with a disability - To engage in a perpetual change process through learning and re-learning ensuring the students with a disability can reach their potential clinically. - To lessen the misconceptions that students with a disability function less effectively than students without a disability. - To promote a culture of greater acceptance and inclusivity for students who present with a disability within the clinical learning environment

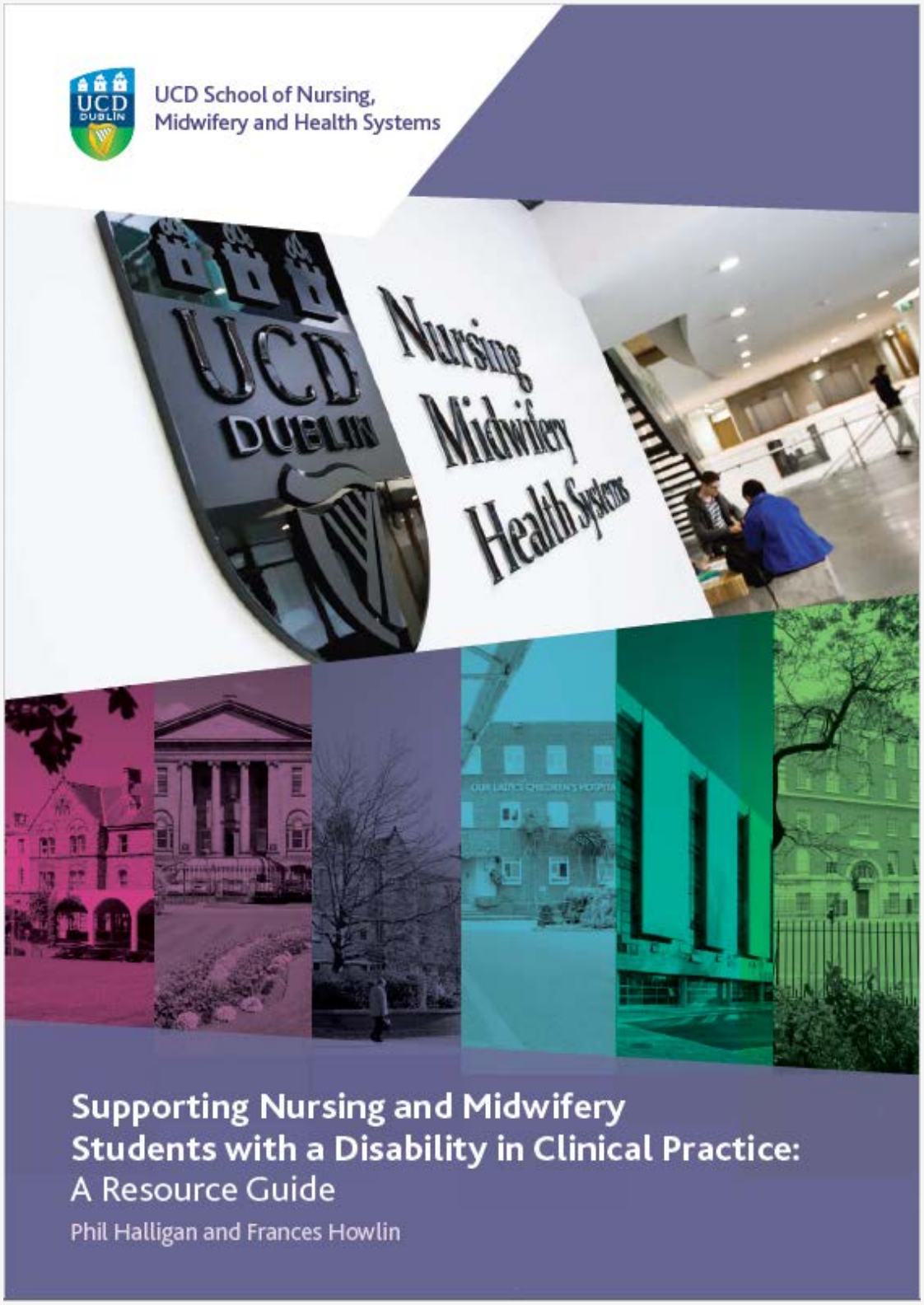

Figure 1: Halligan & Howlin (2016)

Why Universal Design for this initiative?

Prior to the setting up of this dedicated team, at the start of each semester, all module coordinators received notification from UCD Access and Lifelong Learning regarding the number of students on their module registered with a disability and their examination and assessment accommodations. However, what module coordinators had failed to recognise was that many of these accommodations were not easily transferable into clinical practice, which accounted for 50% of their programme. This caused further reflection on how students with a disability managed their own learning in clinical practice and how best to support this learning.

Initially, we felt embarrassed that as module coordinators we had been very closed minded. We paused to think about the vulnerability of these students, wondering if we had let them down. We asked ourselves how difficult it might be for them to disclose to strangers and people in authority in a busy clinical environment. Once the realisation dawned, we knew that something more focused had to be done and although we did not have all the skills and knowledge to provide support for students with a disability, we felt that as a team we had to start somewhere.

When we first started, we realised that the more we thought we knew, the less we knew. Through many seminars, workshops, and discussions we learned that many of us were unaware of the law and rights of people with a disability, and became more mindful of our own attitudes and behaviours towards people with disabilities. We were fearful of being discriminatory whilst at the same time concerned about patient safety and competency issues in clinical practice. However, we felt excited and challenged and confronted our colleagues, friends and authorities about different attitudes and the prevalence of stigma and discrimination around disability.

We knew we did not have all the answers to the many questions regularly raised. We were often asked, why do we have students with disabilities in nursing? We answered: because they are valuable people who can contribute equally safe and effective patient care with great compassion. This journey that we have embarked upon we hope is a joint mission, not only supporting our students, but providing a point of reference for all those who wish to participate on a similar journey in supporting their students.

Design and implementation of the initiative

Since its establishment in 2010, the Disability Liasion Team (DLT) has developed and implemented a number of key innovations to support clinical and academic staff, and students with a documented disability, to facilitate inclusive teaching and learning in the clinical area. A select number of these will be discussed here.

Key interventions include:

- a Resource Guide for staff supporting students in clinical practice
- the development of a Clinical Needs Assessment
- provision of Disability Awareness Training for students and staff

Resource Guide

One of the first initiatives to emerge from our consultations with clinical partners was the development of a resource guide – **Supporting Nursing and Midwifery Students with a Disability in Clinical Practice: A Resource Guide for Clinical and Academic Staff** (see Figure 1).

The guide was intended to address deficits in knowledge around the concept of disability support and to provide additional information for academic and clinical staff who facilitate learning and assessment for students with a disability in clinical practice. Overall, this comprehensive guide describes inclusive policies and practices to be considered when aiming to foster good practice behaviours so that students with a disability can reach their true potential in clinical practice.

The guide also uses vignettes to highlight myths and fears that surround students with a disability which can create barriers to the attainment of a positive student experience in clinical practice. The guide is based on the belief that a student with a disability has the right to **Equitable use**: the same learning opportunities as any other student. This is achieved through **Flexibility in use** through providing reasonable accommodations, thus enabling them to perform their duties to the required standards.

The contents include:

- Background to the development of the resource guide
- Legal obligations, competence & fitness to practice
- Disclosure
- Students journey to clinical placement
- Disabilities & reasonable accommodations
- Supporting students with a disability on placement
- Information & resources

Clinical Needs Assessment

The development of a Clinical Needs Assessment involved a number of steps. It began with a scoping out of published literature to elucidate what was known about conducting Clinical Needs Assessments for students with a disability in clinical practice. The published literature was reviewed and a disappointing paucity of literature was identified on the topic. National and international advocacy organisations for students with a disability were consulted and this proved to be a useful resource as they provided a wealth of information regarding different types of disabilities and suitable supports or accommodations to employ (Disability Advisors Working Network (DAWN) and AHEAD 2007; DAWN 2008; Office of Disability Employment Policy 2013).

It was agreed by all key stakeholders that the development of a Clinical Needs Assessment should ideally address equality, justice and inclusion. Hence, it was deemed important to not conceptualise disability as a condition or illness through the lens of a medical model, but rather from a social model perspective. The application of the social model within a workplace needs assessment ensures that the student's disability is not the focus of the assessment, but rather the specific demands of the profession and the impact of the environment on the ability of the student to learn, and perform, patient care (Howlin, Halligan and O'Toole, 2014). Furthermore, it was decided that the Clinical Needs Assessment should, where possible, be proactive rather than reactive.

Proactive assessments identify student needs on entry to the programme, prior to work placement; while reactive assessments identify student needs when the student experiences difficulties on clinical placement. A three part Clinical Needs Assessment (CNA) was devised based on available literature and informed by the AHEAD Workplace Needs Assessment Model (AHEAD, 2009) (see Figure 2), to support the employment of individuals with a disability. The CNA was developed in three key parts: Part 1 - Student Background and Context, Part 2 - Assessment and Identification of Reasonable Accommodations, and Part 3 - Summary of Clinical Needs Assessment and Reasonable Accommodations.

Part 1 and 2 are retained on a password protected file by a member of the DLT and Part 3 is shared, with the student's consent, with a nominated staff member in the student's parent hospital and her/his personal tutor. On completion of a clinical placement, the student and her/his Preceptor (experienced nurse acting as a guide to the student nurse on placement) are invited to do a review of supports

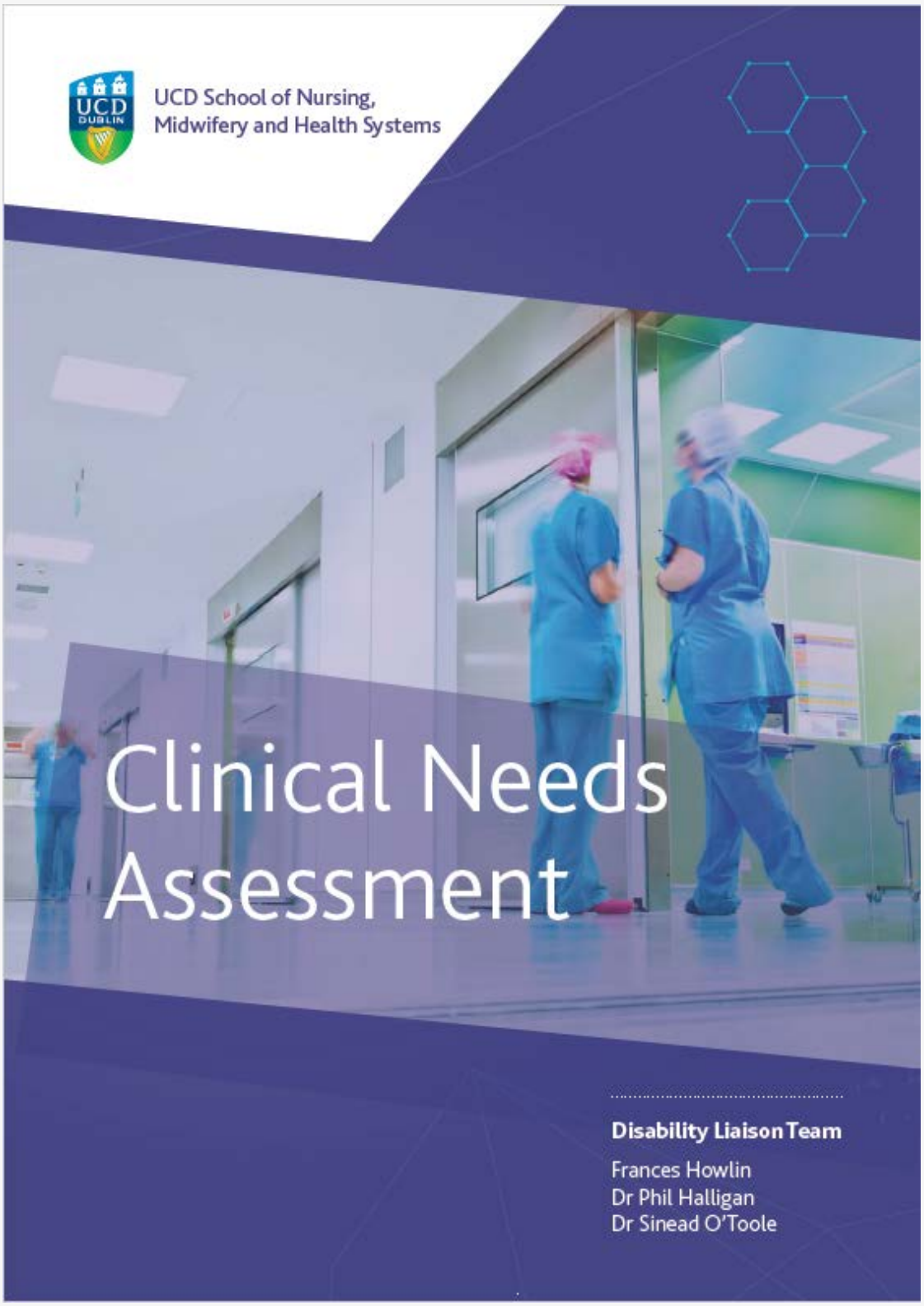

Figure 2: Howlin, Halligan and O'Toole, (2014)

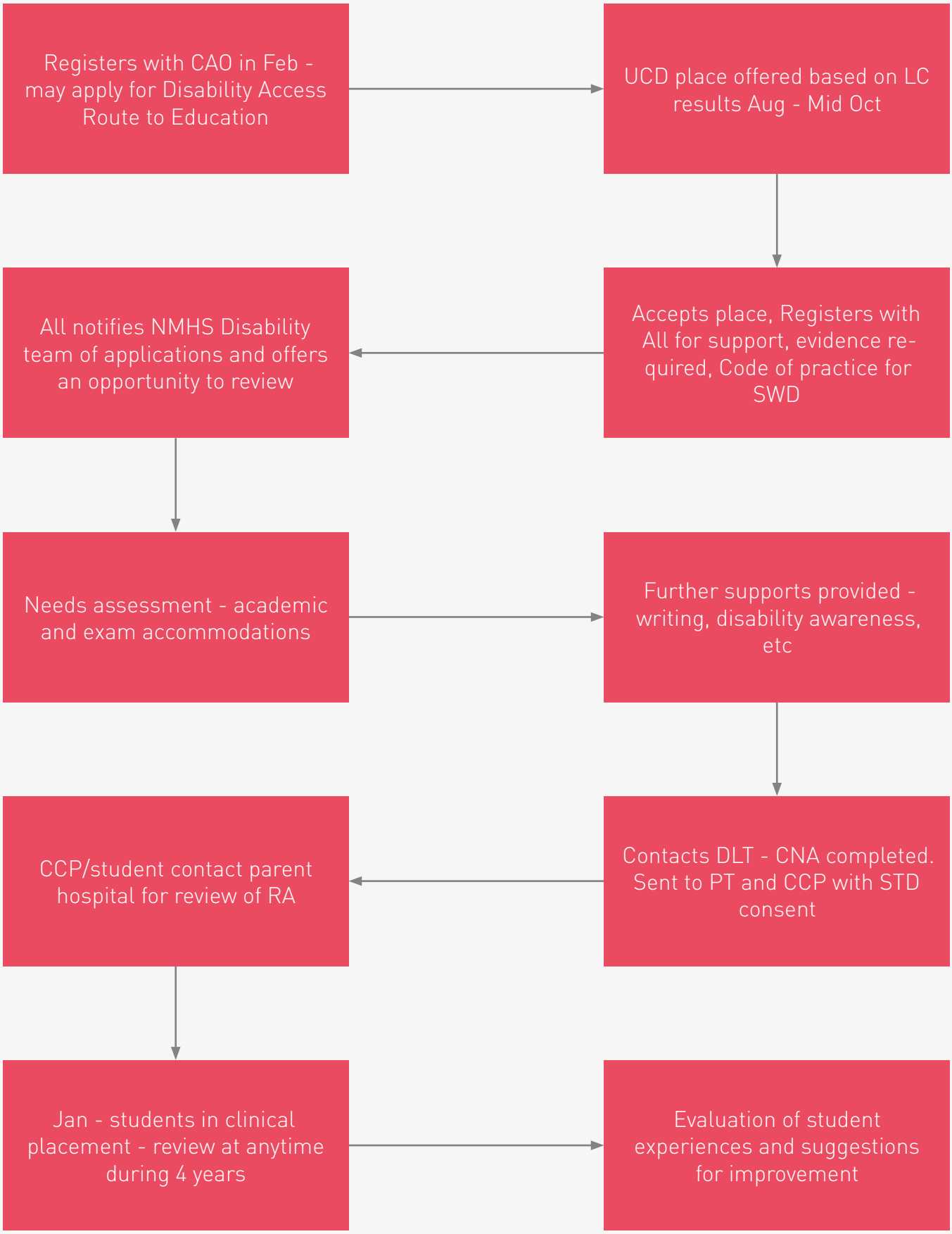

Figure 3: Pathways to support

provided. It is vital that the Clinical Needs Assessment process be **Simple and intuitive** for the student.

Prior to clinical placement, students are also invited to attend a pre-placement preparation workshop where various aspects (how, when, what and to whom) of disclosure are discussed in relation to clinical placement. They are provided with examples of nursing care documentation that they will be exposed to and the many different terms and abbreviations they will be challenged with when they go out on placements.

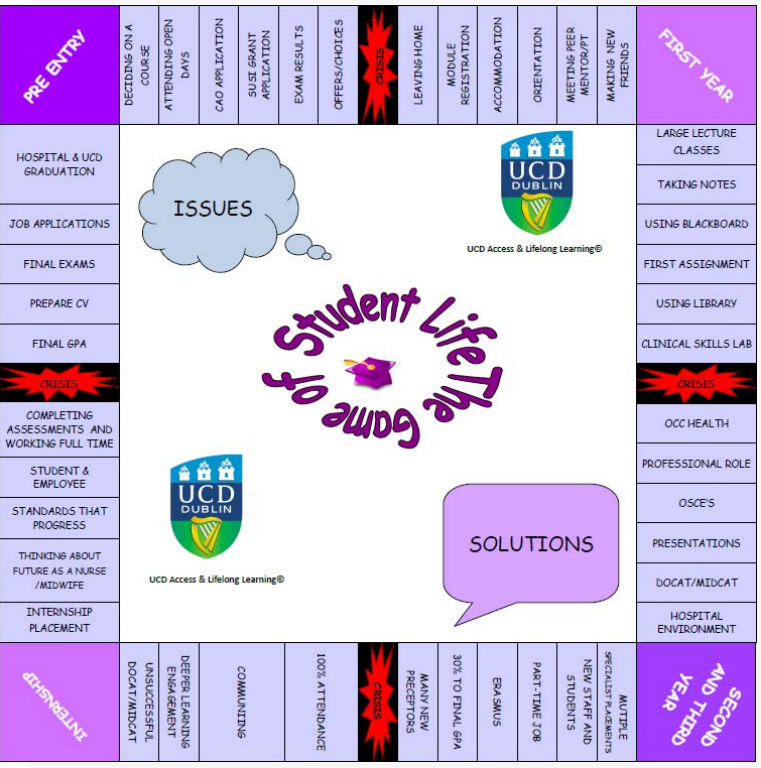

Figure 4: Tool developed by UCD Access & Lifelong Learning and adapted by DLT to increase educators awareness of issues confronting students with a disability entering and progression on Nursing and Midwifery programmes

The key terms and abbreviations encountered by students in clinical practice are given to each student in different formats - booklet, eBook and PDF. They are also given an opportunity to share their concerns with the team and colleagues about disclosure in the workplace and advice is given by a clinical psychologist on how to take care of their mental and physical health and where to go for further help, if required. A positive **Instructional climate** is fostered through this process.

Disability Awareness Training

Each year, the DLT conducts disability awareness training for staff (clinical and academic) that specifically focuses on issues relating to students with a disability in clinical practice (see Figure 4). For example, training has covered the management of non-disclosure and whether there is an occasion when it is okay to ask a student if they have a disability. All staff (clinical and academic) are also invited to a workshop on Assisted Technology and finally, a biennial summer school is held in conjunction with AHEAD for educators who support students with a disability in healthcare.

Disability awareness training is also provided to all students (not just those with a disability) at every stage of their programme to highlight the services we provide.

How do we know it worked?

The clinical experience has always been considered to be a fundamental part of nurse education, as it prepares the student to be a successful, competent and confident graduate nurse. Clinical experience is one of the components of the nursing program which has been identified by nursing students as causing the most anxiety, and this might potentially cause even more anxiety for the student who presents with a disability.

Nursing students registered with a disability over the last five years, for the most part, have indicated a high level of satisfaction within the clinical learning environments and have suggested that they have benefited from undertaking a Clinical Needs Assessment, prior to attending the clinical aspect of their programme. Although they have voiced concerns over disclosure, they have suggested that clinical staff were empathetic and supportive of their needs in the majority of instances.

Utilising a clinical needs approach has demonstrated that the university has a shared responsibility to provide accommodations for students prior to them going out to the clinical sites, equally the clinical sites have a responsibility to ensure that such accommodations are implemented.

Collaboration amongst academic and clinical staff can ensure that the student can reap the benefits of receiving accommodations in a timely fashion, and this ultimately can assist in enhancing student success.

As educators, we have a unique opportunity to examine what is possible as an accommodation (see Figure 5) as it related to students with disabilities and thus innovative approaches to reasonable accommodations can potentially eliminate barriers for students with a disability.

Figure 5: Adapted stethoscope for a student with a hearing impairment

By removing such barriers we can rethink the contributions that students with a disability can bring to the nursing profession and can decrease the discrimination and marginalisation of such individuals. Because of the diverse nature of nursing roles and the range of practice settings, students

with disabilities upon graduation are able to negotiate bespoke pathways that will result in satisfying and successful careers and in our experience their disability fails to restrict them.

Advice to others for implementation

The strongest piece of advice we can offer for others who are seeking to provide support for students with a disability on placement is to collaborate with as many stakeholders and colleagues as possible. Many factors have helped us to achieve so much in such a short time. Having the support of UCD Access & Lifelong Learning, AHEAD, and collaborating with colleagues in the UK who are interested in providing the same support to their students and seeing students' graduate having had a positive experience has made it all worthwhile. The students' feedback on their experiences of support and disclosure has also reassured us that we are doing the right thing, rather than doing things right!

Finally, having the support from management in the School of Nursing, Midwifery and Health Systems in terms of financial resources has also been very helpful. If you are starting this process, taking even a small step can have significant benefits for the students you are supporting.

Start off just by having a conversation with the student about what they can expect on placement and what, if any, supports they think they may need. This small step of opening the dialogue can make a real difference for your students.

Acknowledgements

This case study was developed from Promoting Inclusive Learning Environments for Nursing and Midwifery Students on Work Placements, The All Ireland Society for Higher Education (AISHE) Academic Practice Guidelines Booklet 2. Thanks to Ms Frances Howlin for her extensive contribution as a previous member of the Disability Liaison Team.

"The Needs Assessment decreased a lot of worries I had being feeling"
(Stage 1 Nursing student)

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SECTION

2

Classroom Teaching and Learning Processes and Materials

Chapter 6: "I'm a busy distance learner" – Engage me!

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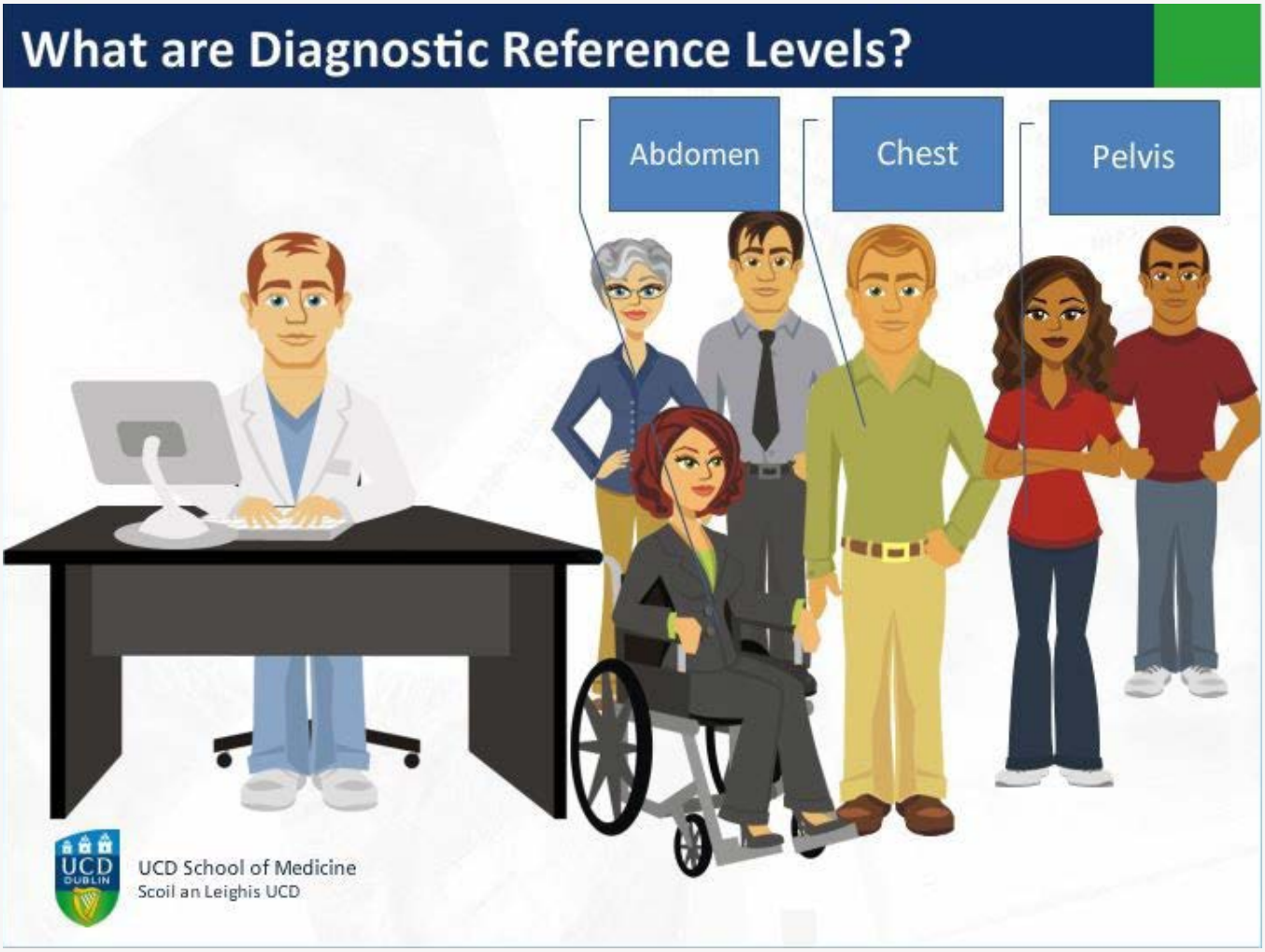


Module Name	Patient Care & Interventional Radiology [RDGY 41250] Technology of Interventional Radiology [RDGY 41260]
Universal Design Principles	- Simple & intuitive - Flexibility in use - Tolerance for error - Community of learners
Discipline	Radiology
Level	UCD levels 4
College	Health and Agricultural Sciences
Learning Outcomes	**Patient Care & Interventional Radiology [RDGY 41250]** On successful completion of this module, the student should be able to: - competently discuss a wide range of procedural aspects of interventional procedures within the context of service provision and patient outcomes. - demonstrate an awareness of the need to adapt all aspects of procedural technique in individual procedures based on patient presentation, case history and procedural environment. - critically reflect on the advantages of using interventional radiology to develop and improve the quality of service provision in the Imaging Department **Technology of Interventional Radiology [RDGY 41260]** On successful completion of this module, the student should be able to: - challenge and optimise the application of IR technology across a range of clinical contexts - appraise IR safety and facility design issues from diverse perspectives from angiography suites to hybrid operating theatres - isolate and focus on the challenges associated with the evolving nature of IR technologies and suggest appropriate solutions

Introduction

Our distance learners, like many others, are very busy people. We decided to engage our diverse group of students through implementing Universal Design principles in our modules. These modules are designed for radiographers working in the area of interventional radiology. They aim to provide students with an in depth knowledge of the procedures provided by interventional radiology. There is a systematic approach to discussing the interventional procedures currently performed in Irish hospitals focussing on promoting both professional knowledge and quality of service in the interventional radiology (IR) environment. These modules aim to develop each student's knowledge and understanding of the aetiology of the disease processes that present in the IR department, their compatibility with radiological intervention, the possible procedural risks and complications and the expected outcomes for each patient.

Why Universal Design for these online modules?

Students on this course are graduate radiographers who work in a clinical setting. This course is studied out of hours or in very limited amounts of time that students might have available during working hours.

The majority of students would not have previously studied online. We also had a small number of international students taking this module for whom English is a second language. With a diverse group of students, studying in challenging circumstances, a Universal Design approach helped us to work towards meeting the needs of as many students as possible.

Our intention was to be able to structure the content into small segments so that learners felt that they could complete a section even with limited time and in this way they would be given a sense of making real progress (Hart, 2012). We also wanted to help learners to put the learning into context and to be able to transfer the learning to their work environment. The principles of Universal Design in the context of e-learning emphasise the need for learning to be presented in the simplest format possible, allowing for learning to be prioritised over the need to acquire additional digital skills (Elias, 2011).

Design and implementation of the module

We particularly focused on **Flexibility in use**, ensuring that there are multiple means of representation through audio, visuals, transcript and text, as well as interactivity to promote transfer of learning.

We also included multiple means of action and expression, through the inclusion of resources, notes and a variety of quiz types. We aimed to improve student engagement through combining some live online tutorials with the main content of the course.
As well as a visual explanation given through the slides and a voiceover explaining the content, we include a transcript in all of our modules to ensure that the content is accessible to all learners (ensuring the use of sans serif font throughout). The transcript can be seen on the left of the slide shown in Figure 1.

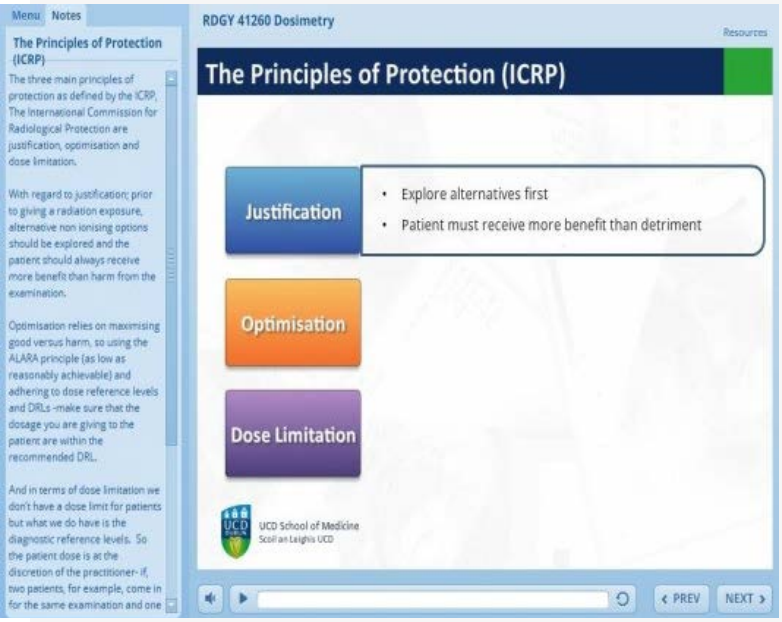


Figure 1: Transcript (on the left of the slide) and voiceover are available for all slides

We also use video, where appropriate, to provide further illustration of complex topics. This provides another media format to meet the principle of multiple means of representation as shown in the video still in Figure 2.

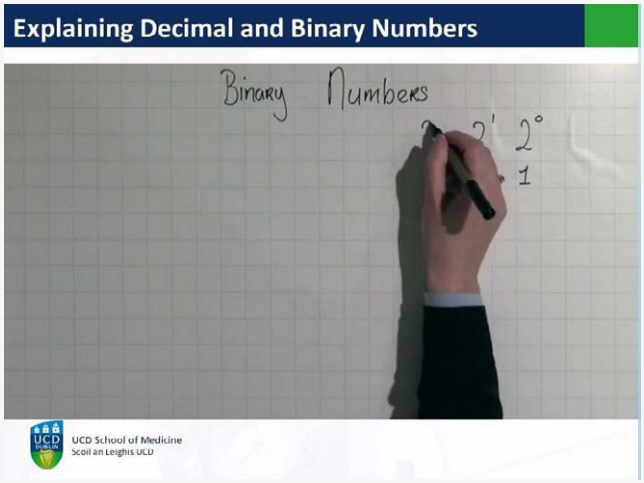


Figure 2: Video explaining Decimal and Binary Numbers

Video is particularly effective for maths as voiceover and text alone can be difficult to follow in maths education.

'Big Ideas' are highlighted through text or illustrations to reinforce the key points being described on each slide. Figure 3 shows how relationships between key areas or ideas can be clearly shown in an illustration improving the learning process.

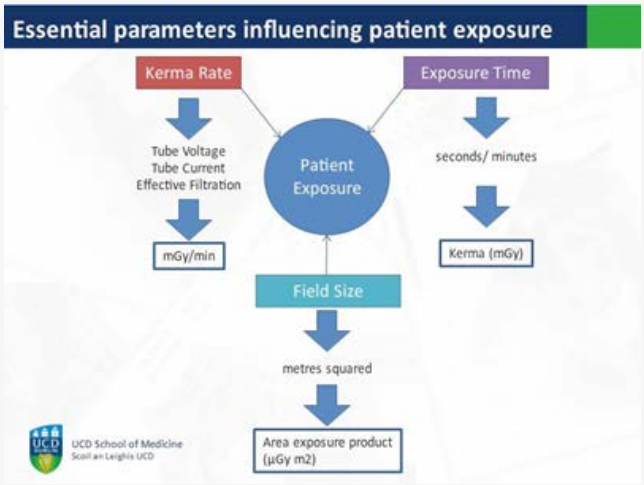


Figure 3: Big ideas and relationships are clearly shown in illustrations allowing for visual learning

Relationships can be explained more clearly by requiring learners to move through the steps of a process as shown in Figure 4.

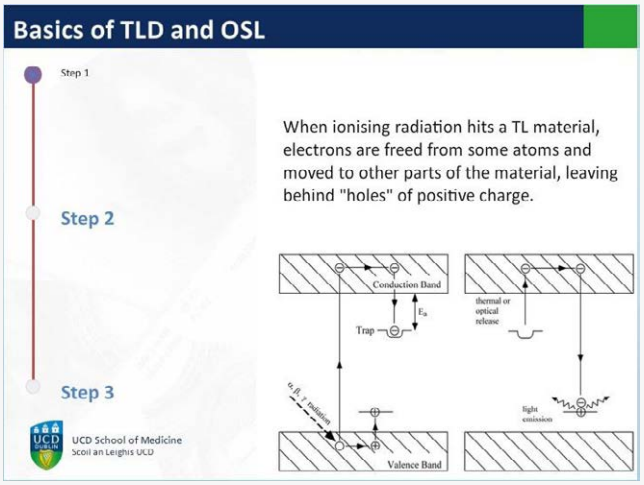


Figure 4: Students can move through the steps of a process to view the content and listen to audio material

Learners can click on each step to view content and listen to the audio explanation of that part of the process. In order to highlight patterns, where there are a number of comparative concepts or procedures in a topic, each will be broken into separate learning objects and chapters. The same structure and similar slide layouts are used in each section to ensure the approach is **Simple and intuitive** and to highlight to students the similarities and differences between each concept.

Branching or layered slides are used to emphasise the critical features and connections between two subtopics. For example, in Figure 5, the learner clicks the buttons to learn about employer and employee responsibilities - connected but different information.

Figure 5: Branching slides allow students to click through to see connected information

Content is released progressively each week and, as previously mentioned, is further 'chunked' into smaller topics where appropriate as shown in Figure 6. Each section is clearly labelled and easy to navigate for students.

In this way the content is made more accessible to learners. A full notes document is also included for each lecture in Blackboard. These consist of a screenshot of each slide and space for note taking as shown in Figure 7.

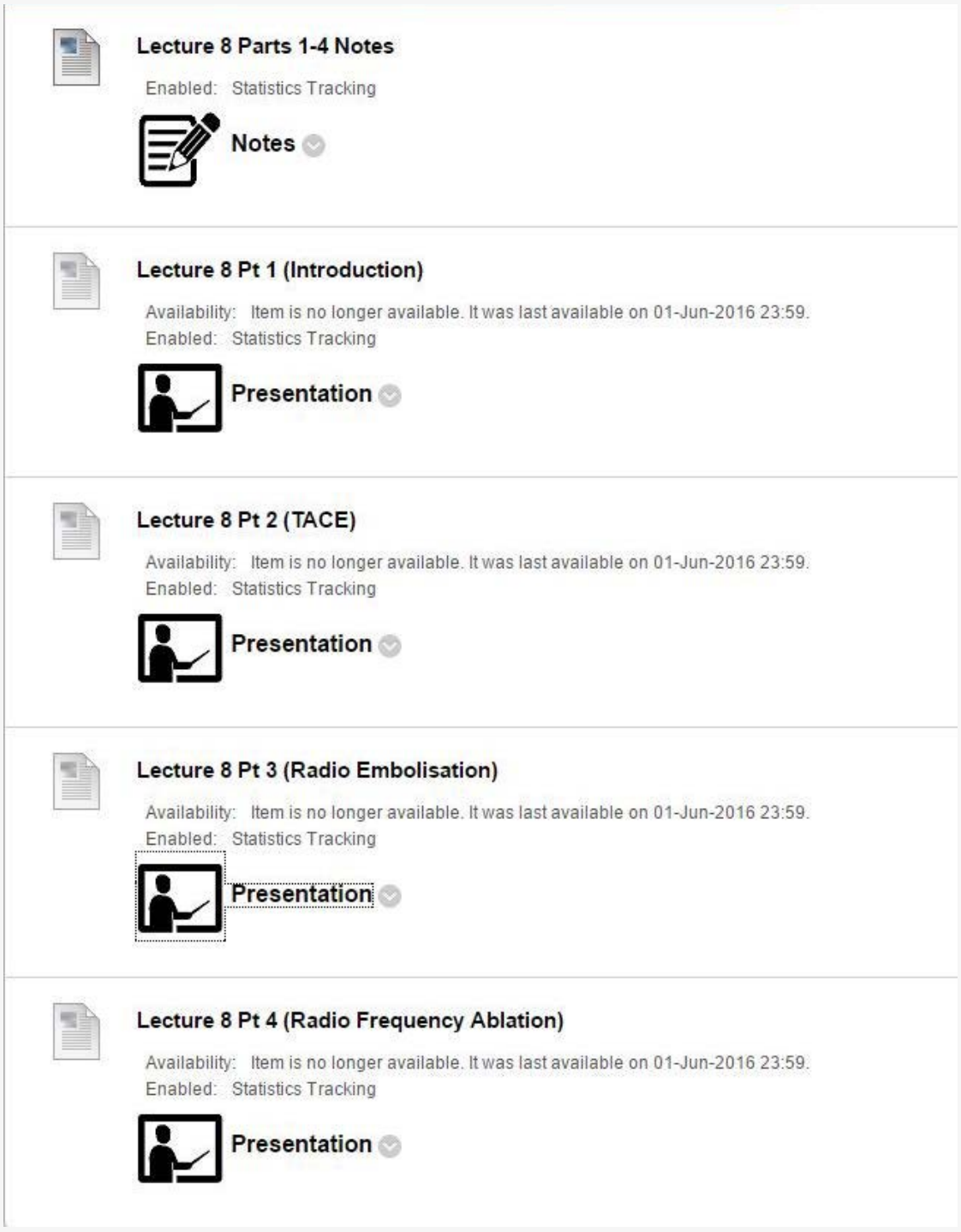


Figure 6: Information is chunked in small sections

1.2 Learning Objectives

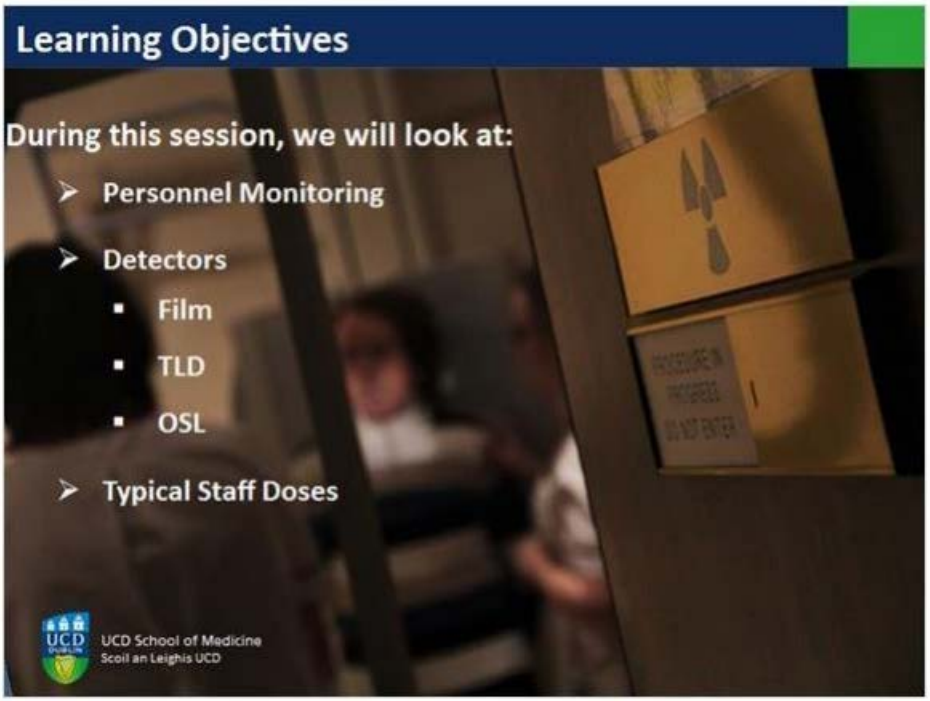


Figure 7: Students can use these notes sheets to take notes on each slide

Learners can take notes on each slide as they view the lecture.

Tabbed slides, as shown in Figure 8, can be used to further break down topics 'chunking' information while still demonstrating the relationship between the sub-topics.

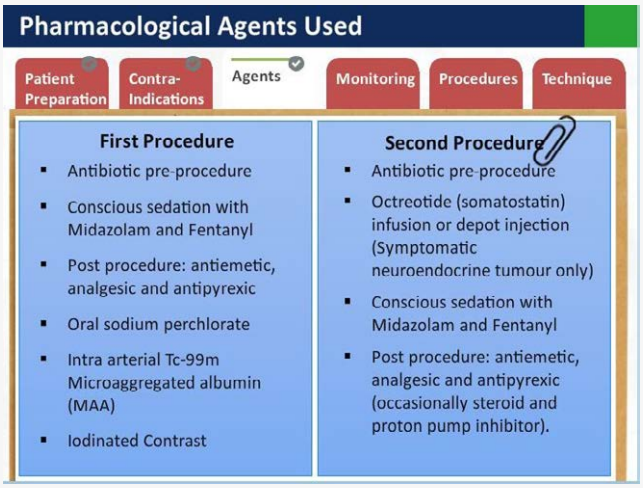


Figure 8: Tabbed slides are used to break down information in to management chunks

Formative quiz questions also assist learners in processing information into usable knowledge and allow for **Tolerance for error**. In the Drag and Drop interaction shown in Figure 9 symptoms jump back to their starting point until they are dropped into the correct folder. In order to provide scaffolds which will help to improve memory and transfer of content, we include elements of active learning where possible. With interactions such as these, it is important to check whether they are accessible for learners using a screen reader or other assistive technology.

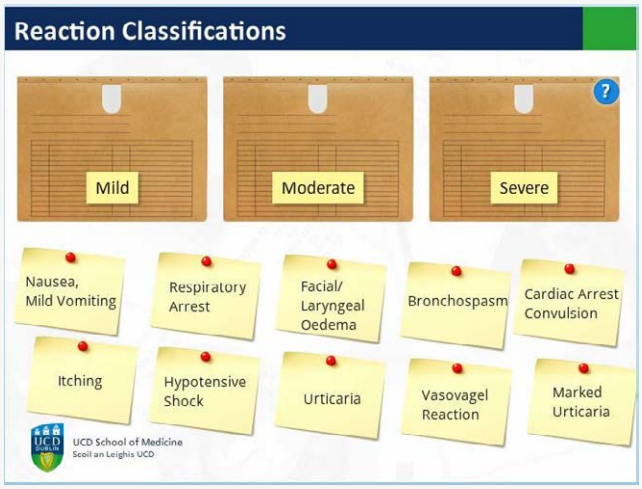


Figure 9: A drag and drop quiz allowing for interactive learning and self-testing

You should be prepared to provide the additional equivalent content in an alternative, accessible format (Mestre, 2006). In the interaction shown in Figure 10, the learner drags the radiographer different distances from the patient, in order to see how this affects the dose of radiation received by the radiographer.

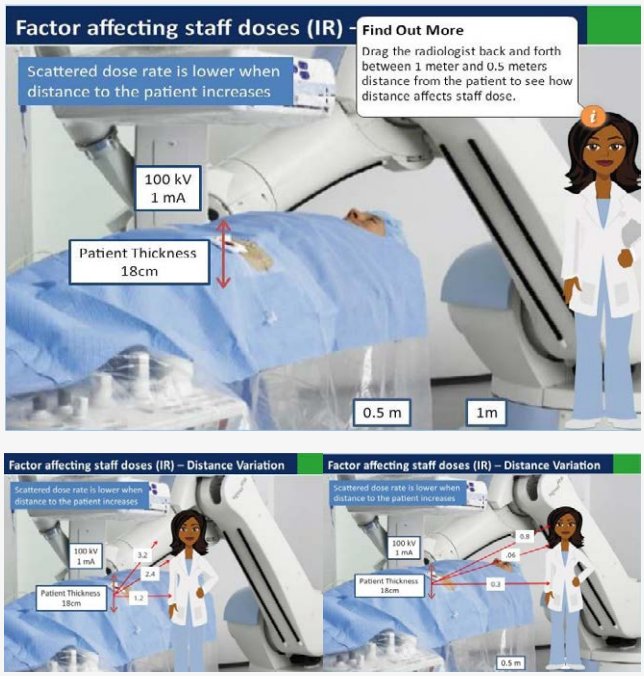


Figure 10: Interactive slide demonstrating staff doses – the learner can drag the radiologist back and forth to see how the dose is affected by distance to see connected information

This facilitates knowledge acquisition, more so than telling the learner the effects directly. Simply using appropriate images for labelling and description can help the learner to transfer the information and put it into context.

Slider functionality can also be used. This illustrates the comparisons by requiring the learner to drag the slider to different options. Not all content will lend itself to this approach but even simple interactions can help to make the content more memorable and transferable by encouraging active rather than passive learning.

A flip card approach, as shown in Figure 11, allows learners to click on each procedure to see the radiation dose. This communicates the information but can also be used by students to test their learning.

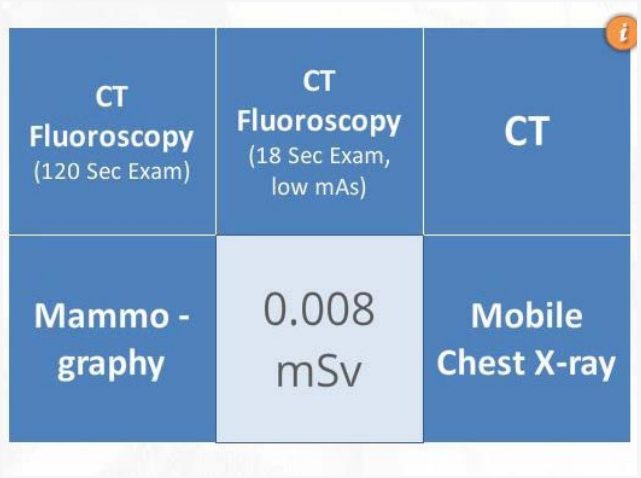


Figure 11: A series of flip cards which reveal the information when clicked

Where resources such as policy documents, regulations or hospital forms are referred to, a copy is made available in the Resources section of the Learning Object. If a journal article is relevant, a link is provided to the article in the UCD library. This can be accessed from the slide itself but is also included in the resources section.

Interaction with faculty and among students is encouraged in order to create a **Community of learners**. Through Blackboard Collaborate students can raise their hand and the academic can enable their microphone or students can use the text box to speak to the lecturer or each other.

The whiteboard in Collaborate is also used to demonstrate samples of exam questions as shown in Figure 12.

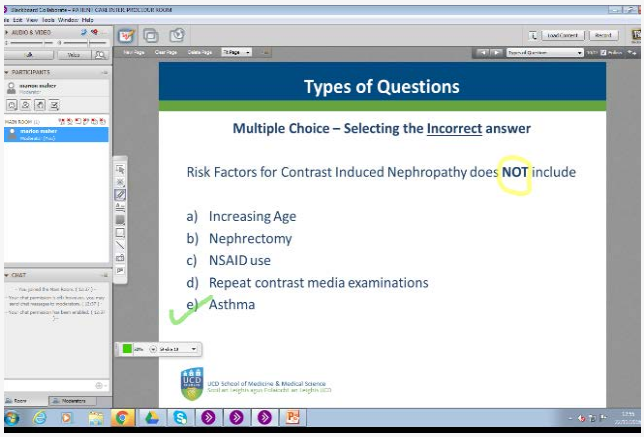
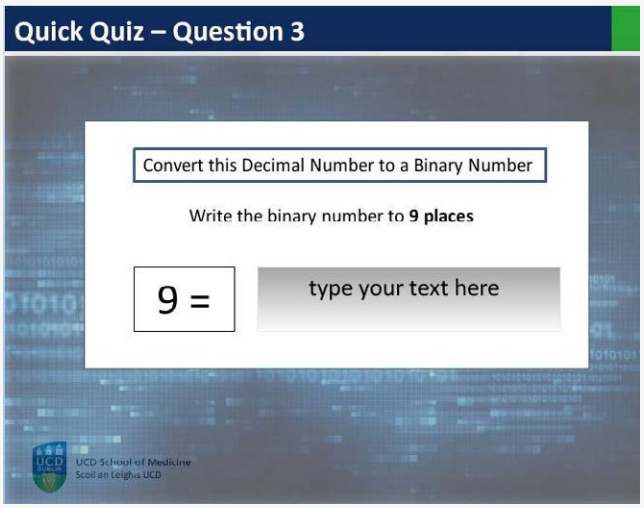


Figure 12: Whiteboard in Blackboard Collaborate used to demonstrate exam questions and to allow for interaction with students.

Different types of quiz questions are included where appropriate. These are formative and learners are given several attempts at each question. If the answer is incorrect, the correct answer is provided or learners are directed back to the relevant slide where they can review the information. A variety of quiz types are used to appeal to different learners.



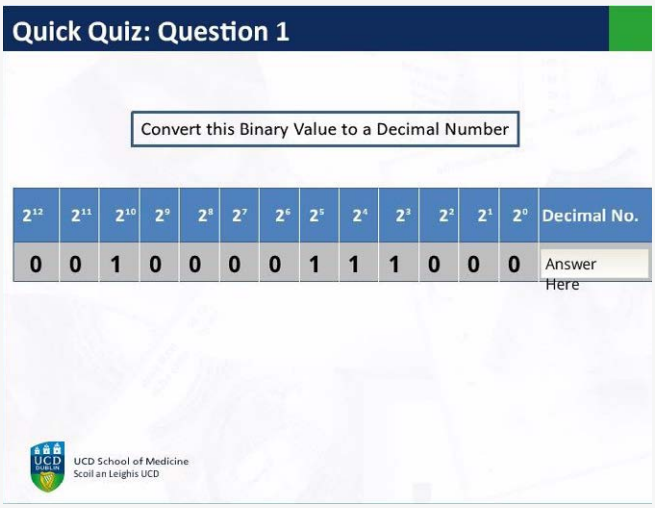
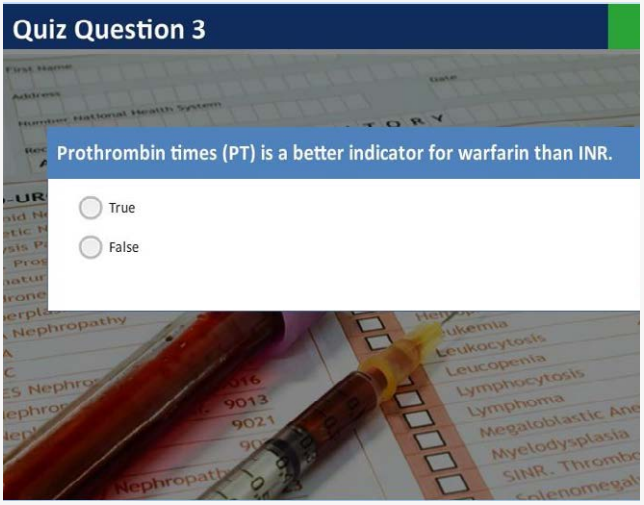


Figure 13: Gapfill – A series of fill in the gap style questions



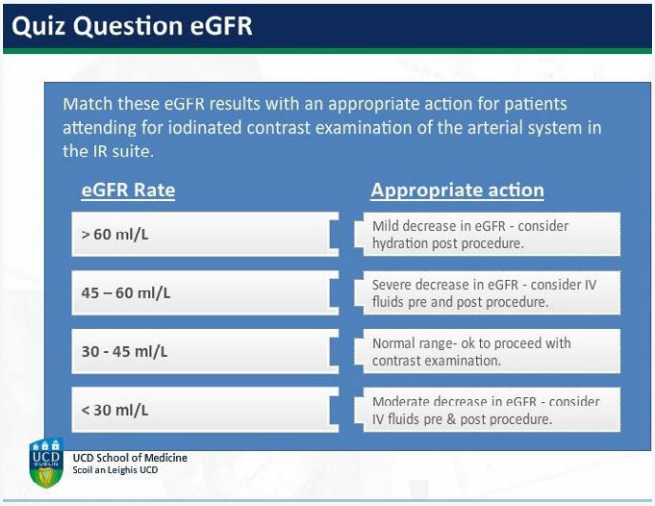
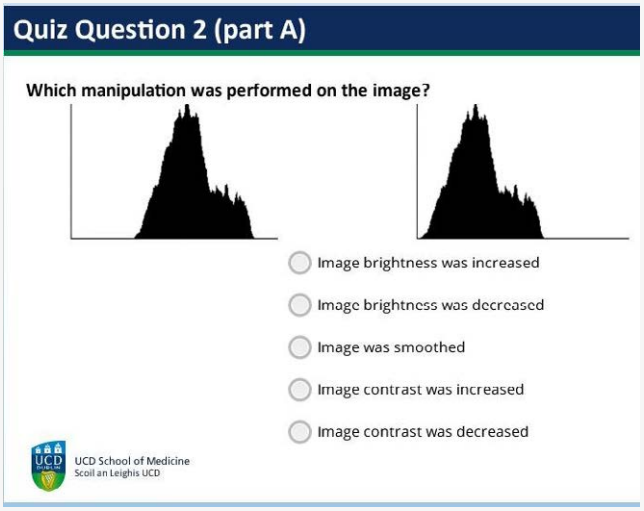


Figure 14: True & False and Matching Pairs



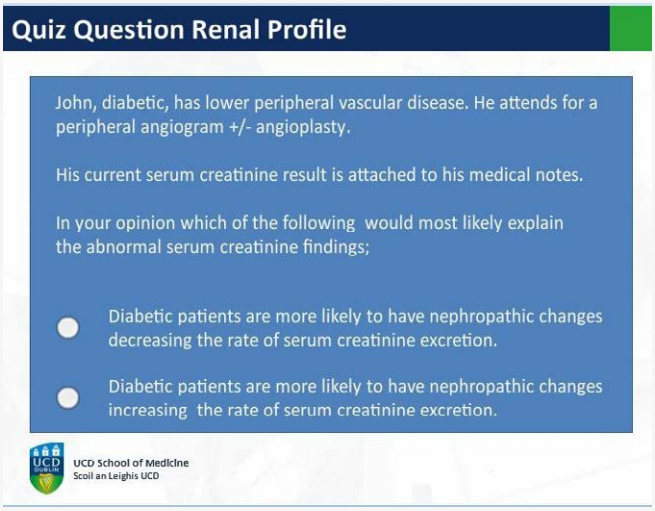


Figure 15: Multiple Choice based on scenario/based on images

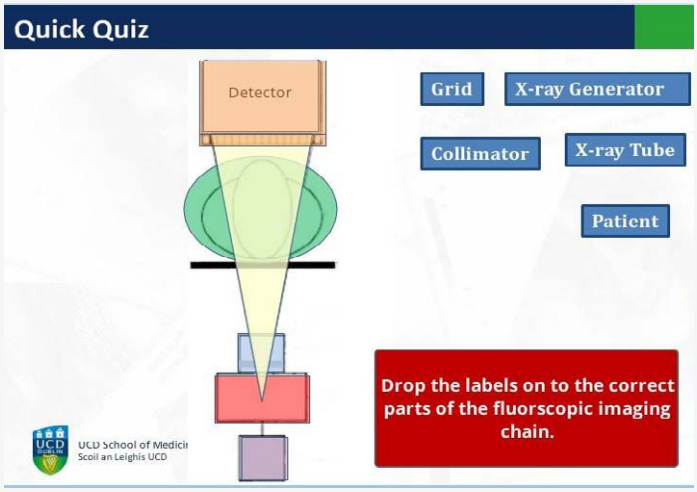


Figure 16: Drag and Drop

“I think the module was well structured.”

“Tutorials gave me confidence in the MCQ exam.”

“I really enjoyed the tasks in the lectures.”

“Shorter lectures are easier to tackle than the lengthy ones.”

STUDENT FEEDBACK

Evidence of impact. How do you know it worked?

This is the second iteration of the course and it was in the most recent release that we really focused on inclusion of interaction, different quiz types and branching as well as the online tutorials.

The feedback we have had is positive with all respondents stating that they were satisfied (40%) or very satisfied (60%) with the course. Students said the following:

Advice to others for implementation

Some interactions such as Drag and Drop will not be accessible to learners using a screen reader. It's important to check the accessibility of templates and activities, however if you feel that it is beneficial to include it, just be sure to include an equivalent, alternative task that is accessible. Implementing Universal Design does not mean having to compromise learning but rather ensuring that there are equivalent options for all learners.

It does take time to include these aspects and to add interactivity to the course so this should be considered in the development process. However, the time taken in development can transform the module from a didactic delivery method to an engaging learning experience. Universal Design also makes the content more accessible to all learners and this should be reflected in students' understanding of the content. Hopefully, because of this, the material will need less work in the future so it is time that is well-invested. Also, once templates for interactions and quizzes are created they can be reused for other learning materials. If changes are needed in the future, the fact that the content is broken down into manageable 'chunks' should mean that any changes will be manageable. We did not include alt-text with our images, mainly due to time restrictions. This is something that we will add in the future, to ensure that content is accessible for learners using a screen reader.

We would recommend in a purely online course, including online tutorials earlier in the course and possibly to do so at regular intervals as students felt that it was helpful to get to know that there are other students on the course. The social aspect of learning and peer learning are particularly beneficial for graduate students who all bring their own experience to the course. A discussion forum would also be beneficial in this regard, although this will require some moderation which may not always be possible.

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Chapter 7: Knowledge to Navigate College

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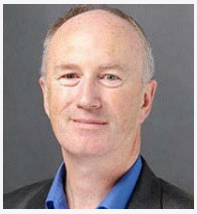

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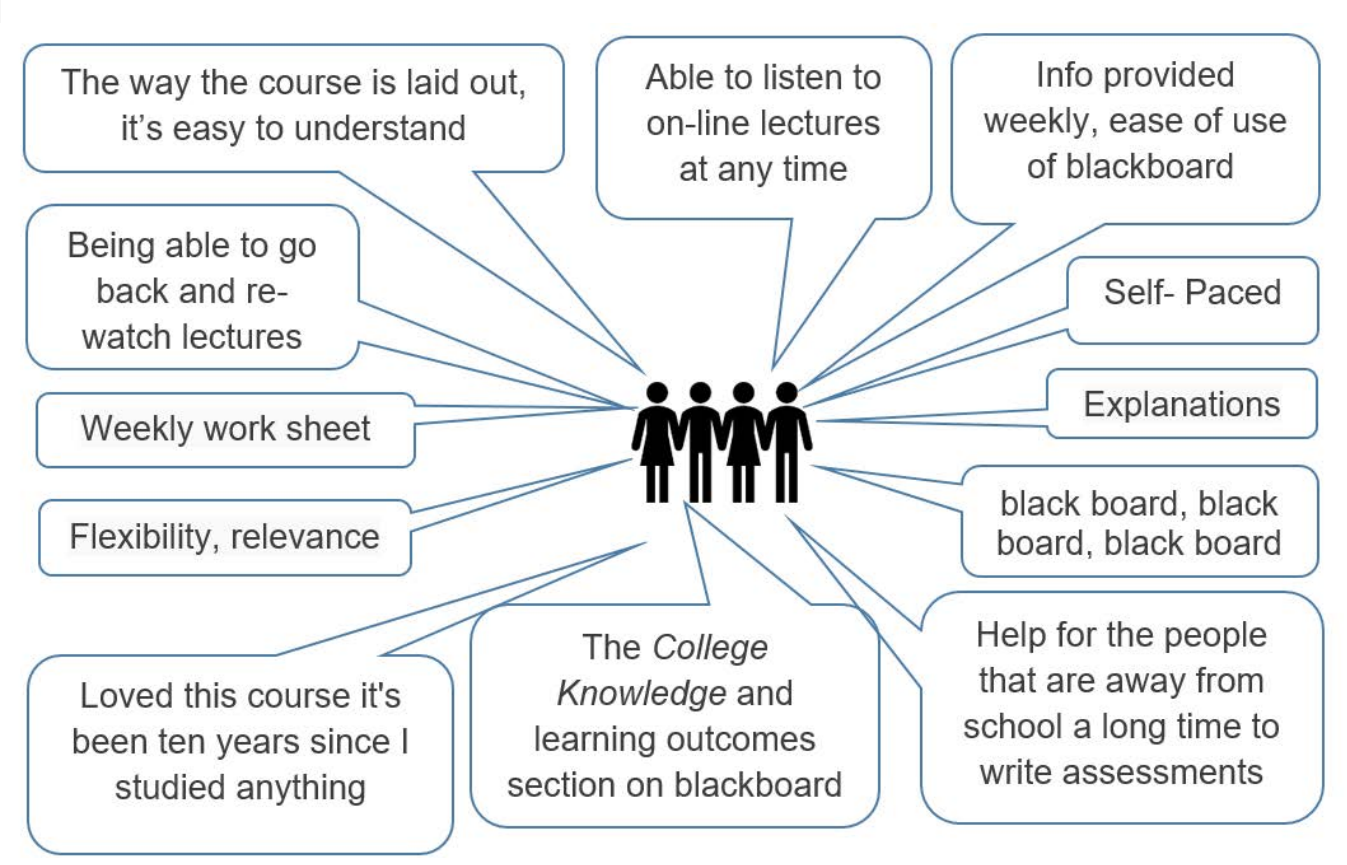


Figure 1: What (three things) most helped your learning?

Programme Name	**UCD Certificate in Safety and Health at Work CTLSC011**
Universal Design Principles	- Equitable use - Flexibility in use - Simple and intuitive - Tolerance for error - A community of learners
Discipline	Occupational Safety and Health
Level	UCD levels 1
College	Health and Agricultural Sciences
Programme Learning Outcomes	**On successful completion of this programme, students should:** - be able to demonstrate knowledge of the principles of occupational safety and health management and an understanding of the legislative environment under which occupational safety and health is managed in Ireland - be able to apply the principles of hazard identification and risk assessment and advise management on implementing the hierarchy of controls in a low risk environment - be able to advise on appropriate health and safety management strategies and know when to call in professional OSH expertise - access and communicate information on a wide range of OSH hazards and risks in a professional manner - be an advocate for safe working practices and a positive safety culture - have developed transferable skills that will enable them to become lifelong learners

Introduction and context

Transition from the workplace to the University is always challenging for mature students (Murphy and Fleming, 2000), and in practise can be more challenging when staff rarely meet students face to face. We have offered a distance education, part-time 20-credit Certificate in Safety and Health at Work for working adults with an interest in Occupational Safety and Health (OSH) for many years. In September 2013, in response to recessionary demographic changes, we moved from distance to online delivery, and the Certificate programme now uses a blend of online activities over two semesters, combined with four days of live face-to-face engagement in UCD (or in an in-company centre). Teaching methods include:

1. Asynchronous online lectures;
2. Bespoke online educational resources;
3. A Weekly Workbook that guides students through their tasks;
4. Tutor-led online discussion fora;
5. Tutor-led Blackboard Collaborate tutorials; and
6. Tutor-led problem-based live tutorials (online x 3 and on-campus x 4).

Since going online, we have developed a suite of online orientation and study supports, not previously necessary. We placed together in a framework that we have labelled 'College Knowledge' (using Murphy and Fleming's term), to help students to navigate the system and to settle into third level study. Our resources are delivered in a just-in-time, take-it-or-leave-it manner, and while none are subject specific, all are bespoke to the programme. Universal Design is embedded in the design of the system.

Why Universal Design for this programme?

Our students work full-time, have work and domestic commitments and don't put aside time for settling in to the University. They rarely use the excellent resources and advice provided on the institution's website, or our bespoke programme handbooks. Settling-in information is often gleaned from other students, and can be based on assumptions rather than fact, further compounding transition challenges.

Design of our resources was based on adult education principles, which include the values of student-support, adult-friendliness, work-relatedness, accessibility and professional relevance, and were designed for working adults of differing ages, educational and work backgrounds, and learning abilities. The overlap between the principles of adult education and Universal Design is large. Rather than our making a conscious decision to use Universal

Design, it emerged from many programme components; for example, the use of blended learning makes the programme more accessible from geographic and time perspectives, and the consequent reduction in travel requirements accommodates students' competing work and family commitments.

Design and implementation

Design of the system of supports described in this chapter did not originally follow any pre-conceived plan. Individual components evolved iteratively, taking account of feedback from students and tutors, and the experiences of programme staff. Linking the resources to each other, and presenting them collectively under a 'brand' (so-called College Knowledge) was introduced to increase its visibility.

Because the supports are presented in a 'take-it-or-leave-it' manner, they accommodate students with diverse learning abilities allowing for **Equitable use**. The student cohort is male-dominated (about 70%), typically aged early to mid-thirties, with a range from early twenties to retirement. Students usually have new or impending work-related OSH responsibilities or seek career enhancement. Like any working adult cohort, they bring years of work experience, and have a lot to learn from and teach one another. In contrast to many disciplines, an OSH student's choice of programme level is dictated by the degree of OSH responsibility held or planned. Thus applicants' highest education level consistently ranges from Inter/Junior/Leaving Certificate, through apprenticeships, trades and vocational qualifications, to Diplomas and Degrees, including MSc and PhD degrees (i.e. Irish level 5 to 9). We know from application data that this is the first college experience for about half of students on this programme. Some graduate entrants attained their degree decades previously, when college systems and learning methods were very different. The transition from work (where students hold a lot of responsibility) to the University (where everything from the systems to the content is new) can be very challenging and time-consuming. The process of adults becoming a University student and settling into the system has been labelled as "a significant social displacement" (Biggs et al, 2012, p.3). We designed our 'College Knowledge' resources to ease this transition and to make it user-friendly for students who are new to any University or new to this University. Some of the 'College Knowledge' components are illustrated in Figures 2 to 5.

Most students' first introduction to our resources is a Studying Effectively E-Lecture, which is provided on our website

for applicants. It is designed to reassure applicants with no previous third level experience, and to give them a sense of what will be expected of them. Remaining components are introduced as needed.

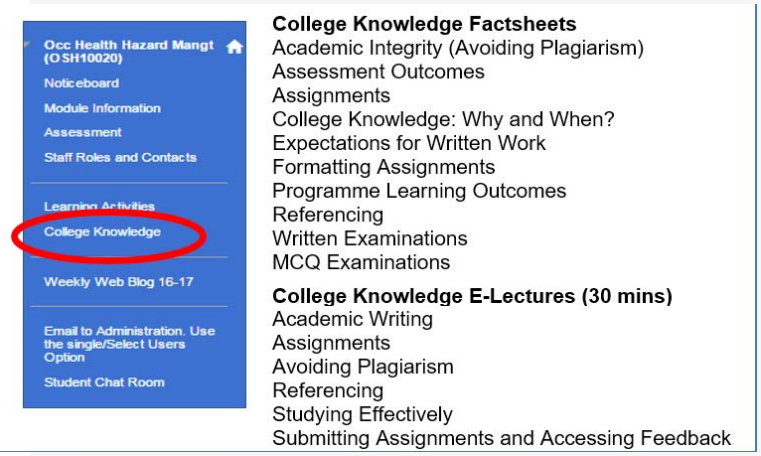


Figure 2: College Knowledge Factsheets and E-lectures on Blackboard

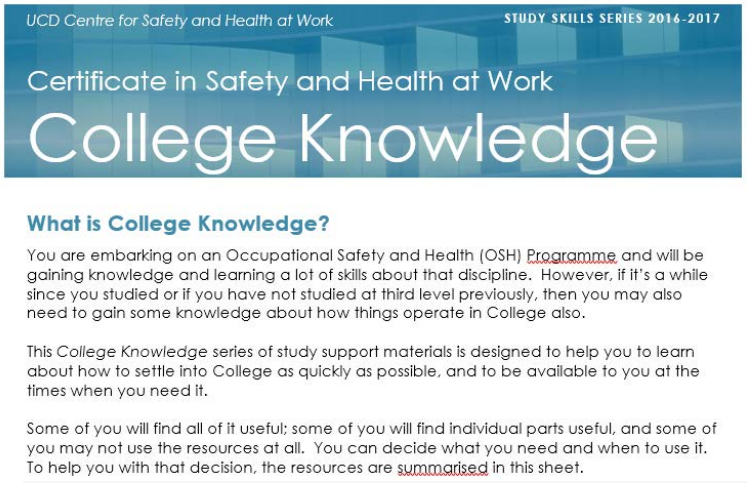


Figure 3: Sample College Knowledge Factsheet

The design incorporates **Flexibility in use** as it accommodates individuals' personal learning preferences. College Knowledge resources are designed to sit alongside the curriculum; none are essential components for credit. Effectively students can take them or leave them; and if they take them, they can use them whenever and as often as they wish.

Students are directed (by the Weekly Workbook) to Study Skills E-lectures or Factsheets exactly when they first need them, and thereafter relevant resources can be quickly re-navigated to find advice on any issue when it arises again.

The Articulate Storyline software used to create E-Lectures has menu and search facilities that allow students to move quickly to any topic within a lecture; being able to get quickly to a point in a lecture facilitates subsequent and repeated use of a resource by students.

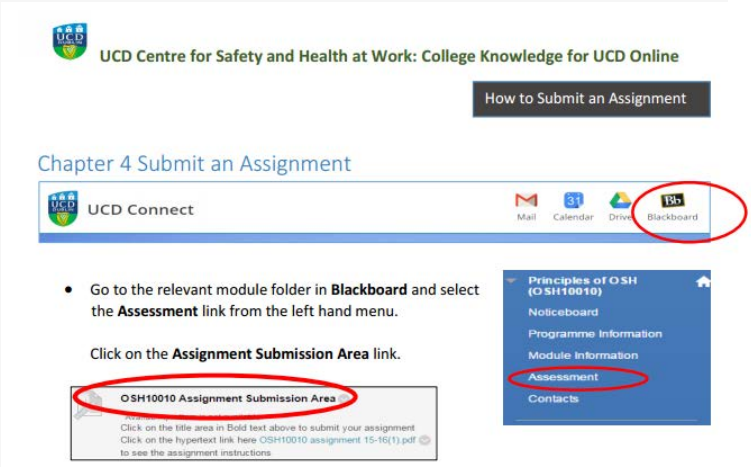


Figure 4: Sample College Knowledge Online Guide

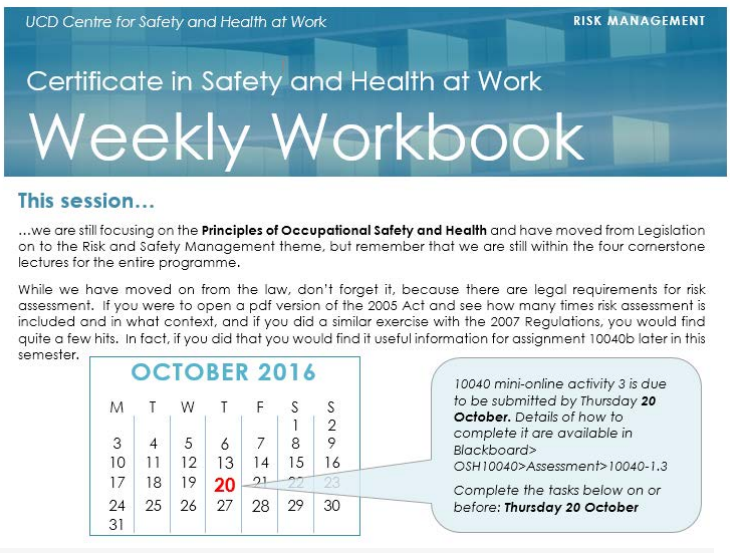


Figure 5: Sample Blended Learning Weekly Workbook

The curriculum content (online lectures and resources) is accessible 24/7 once a student has a good broadband connection. Content is addressed using different modes, which effectively present the core material in several ways, so that students with different learning styles, educational backgrounds and learning abilities can use their preferred mode in different contexts. Modes include the online lecture, self-assessment questions (SAQs) within the lectures, bespoke distance education notes, and direction to (take it or leave it) resources. Guidance on how, when and whether to use resources is provided in the Weekly Workbook. All of this is reinforced by tutors in live online and campus tutorials.

Assessment includes some **Tolerance for error** to encourage students to learn. Self-assessment questions, provided half-way through and at the end of each lecture, give students penalty-free feedback on their responses; in addition low-stakes continuous assessment scaffolds both online orientation and the project module.

All of the resources are designed to be **Simple and intuitive** so that student focus can move quickly to new content learning, as opposed to getting stuck on orientation and navigational learning.

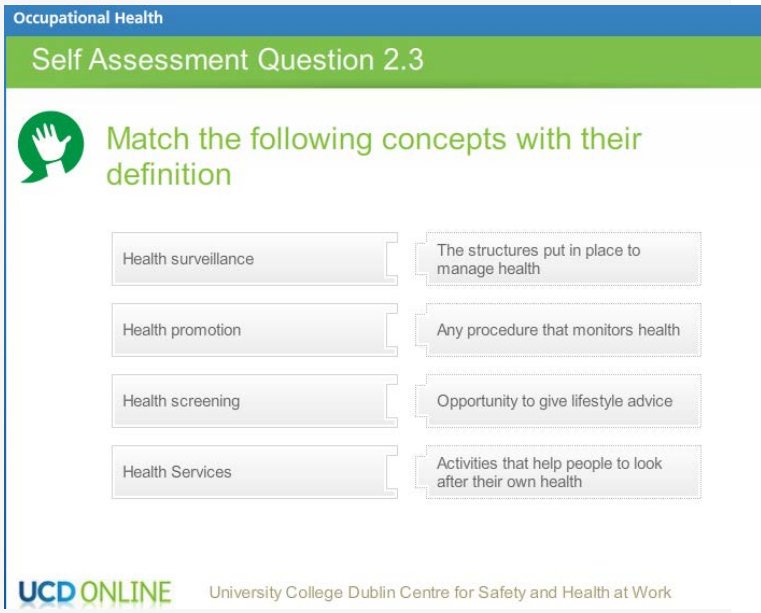


Figure 6: Sample Learning Mode - Optional Self-Assessment Questions within E-Lectures

We try to make systems within our control easy to understand, regardless of the user's previous experience or IT knowledge (allowing **Equity of Use**). Where possible, design templates are consistent so students only need to orientate once (i.e. navigate and locate).

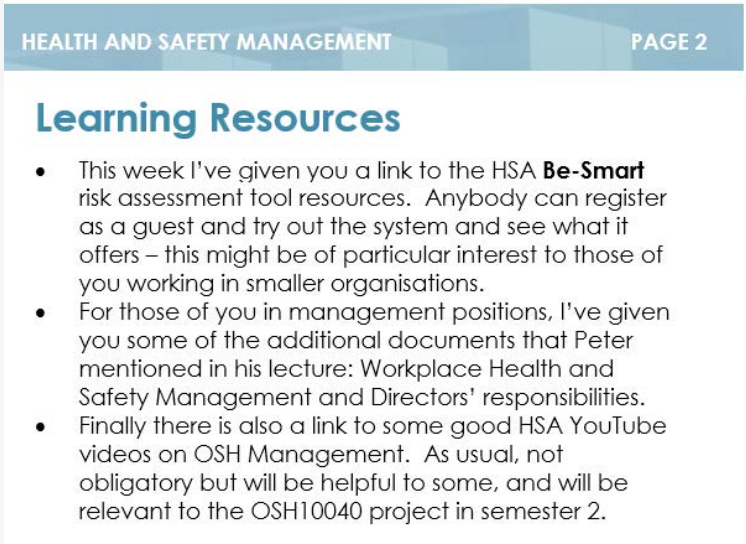
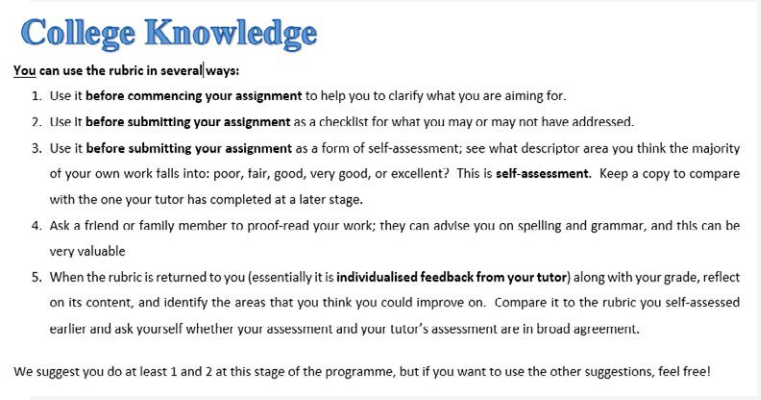


Figure 7: Sample Learning Mode – Direction to Optional Resources

Only one third of the programme is delivered in semester I, so students (who need it) have plenty of time to settle into University and learn the systems, without being overloaded with content. The remaining two thirds are delivered in semester 2. Presentation of all aspects of weekly content is identical in every module; this includes Blackboard, document design, assessment instruction headings and feedback design. For example, the Blackboard layout for each module is consistent (Figure 8), so once orientation and navigational learning has been achieved early in the first module/semester, no further navigational learning should be necessary, allowing students to focus on content engagement and OSH learning. In another example, each module assignment has an associated rubric, in a standard format. Rubrics are **Simple and intuitive**, easy to understand, regardless of the user's experience, knowledge, or current concentration level (**Equity of use**), with an expectation of increasing engagement by students for rubric use in each sequential module (to the extent that the students chooses to do so). At assignment planning stage, students can therefore see exactly what's required to achieve high grades. This allows students who are confident to simply get on with it, while discreetly supporting those who are new to third level learning (Figure 9). Tutors refer to the rubrics a) when introducing students to assignments during face-to-face UCD tutorials, b) during the pre-assignment live online Blackboard Collaborate tutorials and, finally, c) to grade and provide feedback via Blackboard. The programme coordinator uses the rubrics to aim for a consistent standard of grading between tutors.

Figure 8: Layout and Content of all Blackboard Modules



College Knowledge

You can use the rubric in several ways:

1. Use it **before commencing your assignment** to help you to clarify what you are aiming for.
2. Use it **before submitting your assignment** as a checklist for what you may or may not have addressed.
3. Use it **before submitting your assignment** as a form of self-assessment; see what descriptor area you think the majority of your own work falls into: poor, fair, good, very good, or excellent? This is **self-assessment.** Keep a copy to compare with the one your tutor has completed at a later stage.
4. Ask a friend or family member to proof-read your work; they can advise you on spelling and grammar, and this can be very valuable
5. When the rubric is returned to you (essentially it is **individualised feedback from your tutor**) along with your grade, reflect on its content, and identify the areas that you think you could improve on. Compare it to the rubric you self-assessed earlier and ask yourself whether your assessment and your tutor's assessment are in broad agreement.

We suggest you do at least 1 and 2 at this stage of the programme, but if you want to use the other suggestions, feel free!

Figure 9: Student Guide to using Rubrics

Online student collaboration is encouraged, helping to create a **Community of learners**. While working adult students naturally capitalise on and share informal knowledge, we were concerned that students may not have the same capacity to collaborate, and that this valuable learning opportunity could be reduced in online delivery. In practise the **Flexibility in use** of one or a combination of a) a live campus tutorial. B) a live Blackboard Collaborate Ultra tutorial in each module, c) the formal weekly Web-Blog communication (a discussion forum moderated by group tutors) and d) the formal student-only chat room (plus informal tutorial group WhatsApp forums), worked to help students make long-lasting and valuable working collaborations. This works despite the bulk of student learning taking place remotely, and it also reduces travel time and time away from work and families. This **Flexibility in use** and **Equitable use** ensures that students from very diverse educational (level and discipline) and professional backgrounds as well as geographic location can provide support to one another throughout the programme and establish working relationships that last beyond the programme's end.

How do we know it worked?

We found that blended online learning offered many opportunities for integrating study supports using adult learning and Universal Design principles, thereby enhancing the experience for both students and staff.

Impact

Several indirect and direct indicators (usage of, and feedback on, specific resources, attrition rates) can be used to assess impact. While we cannot attribute impact directly to any single design component, we are confident that Universal Design is a factor in this programme's success.

The University's centrally-collected student feedback (2014-16) on the programme's modules delivered very positive overall feedback, with mean scores ranging from 4.1 to 4.6 (maximum possible = 5) on all five core items for the taught modules, however the response rate (range 33 – 63%) was not optimum.

We therefore also collect programme-level student feedback using a final day in-class survey (2015-16, n = 121, response rate 84%). Results for 'helpfulness to learning' of the optional resources are shown in Figure 10. It is notable that 60% of students on this level 7 programme that year already had pre-entry qualifications at or above level 7 (application data). Theoretically these students should not have needed study skills support, however evaluations show that the majority found them helpful or very helpful to learning.

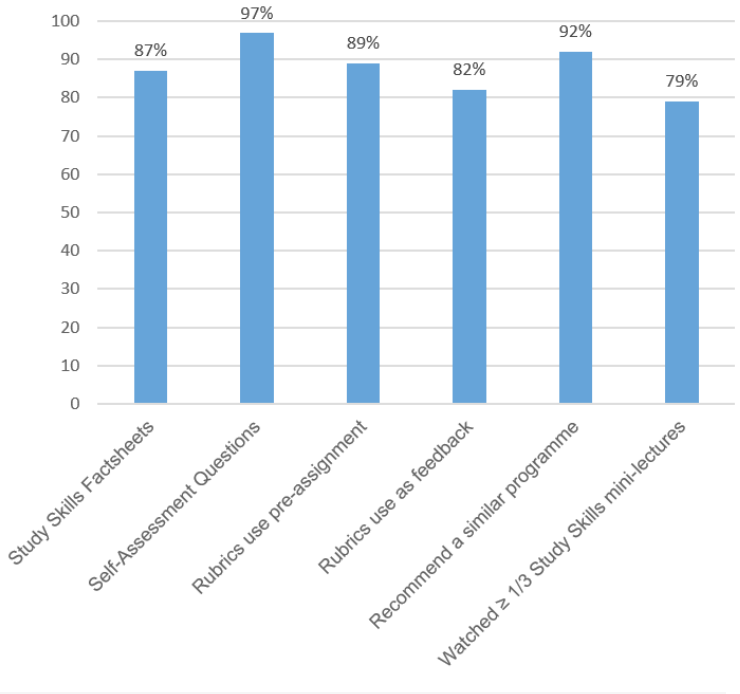


Figure 10: Helpfulness to learning of 'optional' resources

Qualitative feedback (Figure 1 above) included constructive feedback and positive comments on many of the design features addressed in this chapter.

Finally, while acknowledging that attrition is multi-factorial (Sener and Hawkins, 2007) taking account of the triple threats (adult, part-time, asynchronous online learning) to retention, we have seen an extremely low attrition rate (< 10% between 2013 and 2015 and < 5% in 2015-16), particularly compared to rates reported for online courses (20% - 80%) (Tyler-Smyth, 2006).

Advice to others for implementation

- Focusing on embedding orientation and navigational aspects of the programme continuously, as opposed to using an up-front student handbook, can result in **Flexibility in use** and be mutually beneficial for students, tutors and staff. We find that students' narrow their focus much earlier to programme content than previously.
- Providing **Simple and intuitive** just-in-time, bespoke materials for new students in the early stages of the programme can be more efficient (for staff) and more effective (for students).
- Consider overtly presenting supports you would like students to use as being completely optional to allow **Flexibility in use**, and use non-credit bearing assessment to allow **Tolerance for error**.
- 'Branding' a diverse range of supports into a common single entity (College Knowledge) can give students a framework through which to recognise, and use, supports, including using each other, thus helping to create a **Community of Learners**.
- You don't necessarily need to be able to see a final product when starting improvements. Developing our resources was more an evolvement process than a light-bulb moment and is still an ongoing developmental task.
- While existing UCD guidance for new students is excellent, there is so much, located in so many places that some students can be overwhelmed. If this is the case with your students, then taking the time to develop bespoke resources, can be more effective and a good investment and facilitate **Equitable use**.
- We didn't overtly plan to include Universal Design principles but found that it emerged from using both adult learning and blended learning practises. It's possible that minor changes to your existing systems could be all that is needed to find Universal Design principles within your programme.

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Chapter 8: Maths Sparks: Promoting student engagement and developing skills in presentation, communication and team-work

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Figure 1: Undergraduate students working with post-primary pupils during Maths Sparks workshop in 2017

Initiative Name	Maths Sparks: Problem Solving Workshops
Universal Design Principles	- A community of learners - Instructional climate - Flexibility of use
Discipline	Mathematics
College	Science
Programme Learning Outcomes	**Following their participation in this programme, the student should be able to:** - Design a mathematics workshop for senior post-primary pupils, which includes clear learning objectives and associated mathematical tasks aligned to those objectives - Communicate their knowledge of mathematical content, relevant to a specifically designed workshop, to senior post-primary pupils (both to small groups and large audiences) - Work effectively as part of a team in collaboratively designing content, activities, and facilitator information for a mathematics workshop - Critically reflect on their sense-of-belonging to or engagement with the mathematical community through working with undergraduate students across Stages 2 – 4 and academic staff in the UCD School of Mathematics & Statistics

Introduction to Maths Sparks

Two prominent concerns of mathematics education at third level are: improving the engagement of undergraduate students who have chosen to study mathematics and developing these students' communication skills. Maths Sparks: Problem Solving Workshops is a mathematics enrichment programme where workshops are designed by undergraduate students and presented to post-primary pupils. This programme is run by the UCD School of Mathematics & Statistics and is funded and supported by Science Foundation Ireland and UCD Access & Lifelong Learning. Undergraduate students apply to volunteer in the programme, which is run over the course of one semester, with the opportunity to develop their skills of designing a mathematics workshop, working in a team, facilitating mathematical learning, presenting to a large audience and communicating their knowledge of mathematics. Each two-hour workshop is designed by a group of two to three students, under the guidance of academic staff in the UCD School of Mathematics & Statistics, and is presented as part of a series of workshops to senior post-primary pupils.

Why Universal Design for this initiative?

In undergraduate programmes, such as DN200 in the UCD College of Science, where students have opportunity to consider various degree pathways, it has been suggested that a sense of community between staff, students, and peers can promote and enable student engagement and success in Higher Education, particularly in mathematics (Duah & Croft, 2011; Good, Rattan, & Dweck, 2012; Thomas, 2012). We set about developing a mathematics enrichment programme for post-primary pupils, where undergraduate students would engage with one another and with academic staff in designing mathematics workshops. These workshops would then be delivered, over a series of four to six weeks, to senior post-primary pupils (circa 70) from schools (the majority of whom have DEIS[1] status) in the vicinity of UCD. With this programme, we hoped to foster an appreciation of, and interest in, mathematics for post-primary pupils which could, in time, lead them to consider choosing a mathematical programme at third level. Simultaneously, we hoped this programme would begin to develop a **Community of learners** among staff and students within the UCD School of Mathematics and Statistics.

[1]DEIS – Delivering Equality of Opportunity in Schools – are designated as having lower socio-economic status by the Department of Education & Skills

Students who participate in the Maths Sparks programme are undergraduate students who have either chosen to study a mathematics based degree pathway (Stages 3 and 4) or are considering pursuing a mathematics-based pathway (Stage 2) in the UCD College of Science. Through their participation in Maths Sparks, we hope to assist students in developing their presentation, communication and team-work skills, as well as enhancing their engagement in a mathematics degree pathway.

Designing and implementing the programme

In designing this programme, we have attempted to develop a constructive and collaborative **Instructional climate** for participating students. Once accepted to take part in the programme, volunteers are asked to consider mathematics topics they would like to develop as a workshop. At the first meeting of volunteers (between 10 to 15 students) and programme directors (the authors), these ideas are pitched and reviewed by the group in an informal environment. Students then assemble themselves into similarly themed or like-minded groups and begin designing their workshop.

As part of the design process, each undergraduate team is encouraged to contact and work with a member of academic staff, whose research or teaching relates to their chosen topic. Such collaboration aims to further develop and strengthen links between students and staff in the School of Mathematics & Statistics, and also benefit students' knowledge and understanding of the content.

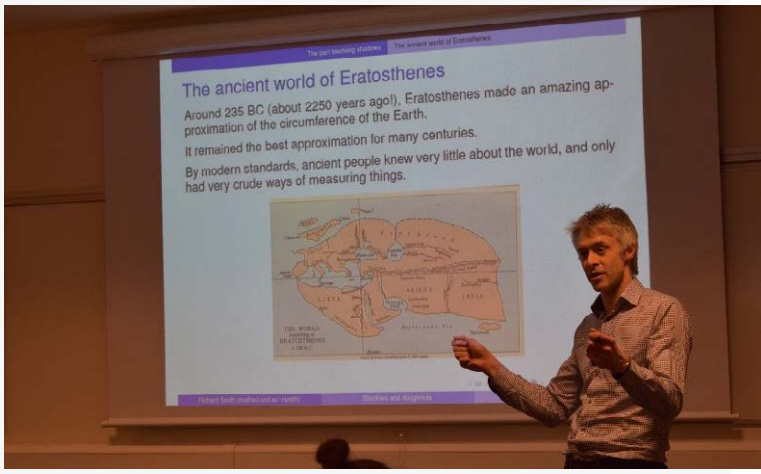

Figure 2: Dr Richard Smith, workshop design mentor, presenting at Maths Sparks 2017

With the objective of positively influencing post-primary pupils' attitudes towards mathematics, each workshop is designed with three guiding features (Verschaffel et al., 1999):

1. Participating pupils should be encouraged to communicate their mathematical thinking as part of a variety of classroom organisational forms
2. Pupils should work on contextualised and meaningful problems
3. Positive beliefs about mathematics should be promoted.

Figure 3: Student volunteer facilitating pupil learning, 2017

In each workshop, there is an emphasis on pupils communicating their mathematical thinking or "sense-making" (Schoenfeld, 1992) as an important feature of their mathematical learning. A variety of classroom organisational forms are included, where pupils work individually, in pairs, or in groups on a mathematical task. The topics and tasks included in each workshop are designed to be contextualised and meaningful to the learners and include high-level cognitive demands, where pupils engage with conceptual ideas underlying mathematical procedures (Boston & Smith, 2009). Throughout each workshop, undergraduate students facilitate pupil learning in, for example, asking guided questions and act as positive role-models of mathematics. In addition, throughout each workshop positive messages about the uses of mathematics and practices of mathematicians are promoted (Boaler, 2016). In considering **Flexibility in use**, undergraduate teams have autonomy in choosing the topic, content and activities included in each workshop.

Over the course of four weeks, each undergraduate team presents their workshop to the undergraduate group for peer review. In this collaborative environment, suggestions are made on the content and tasks to be included in each workshop and students continue to modify and edit their content as appropriate. As a final review, one of the programme directors assesses the workshop content (including presentations, activity sheets and content for other students who will act as facilitators) and resources are then prepared for presentation.

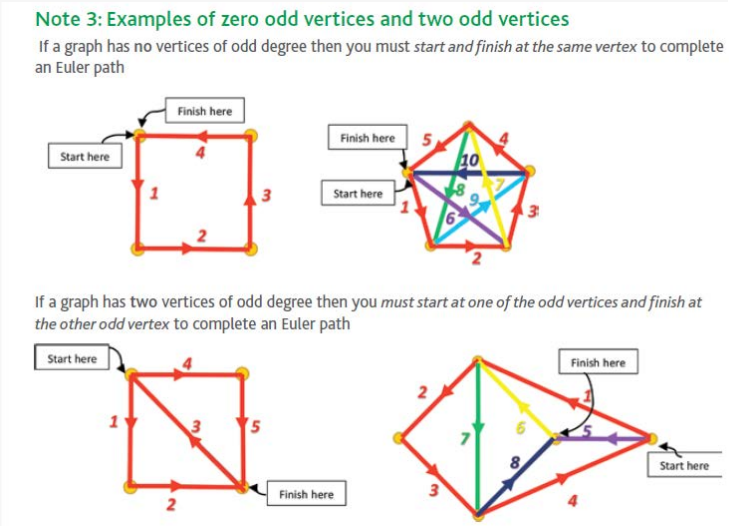

Figure 4: Sample of Graph Theory facilitator notes from Maths Sparks 2016 booklet

Workshops are presented by each undergraduate team to attending post-primary pupils over the following four to six weeks (depending on the number of workshops and volunteers).

Evidence of impact: how do we know it worked?

Maths Sparks: Problem Solving Workshops has now completed its third series and feedback from students has been overwhelmingly positive. Written feedback has been collected from participating volunteers and selected comments are included below.

Undergraduate student engagement

Students have shared reflections on their increased engagement in the School of Mathematics & Statistics as a result of their participation in the programme and commented on a greater sense of belonging to the school as a result of their participation in the programme:

> "I feel a greater sense of community in the School of Maths. Just becoming friendly with Maths Sparks people has helped this."
> - Student volunteer, 2016

> "I feel more comfortable around maths lecturers/staff."
> - Student volunteer, 2016

Students have also commented on the positive element of getting to know others from different pathways and stages of study. This has been particularly important for Stage 2 students who have yet to decide on their degree pathway within the College of Science.

> "Great way to build up links between UCD students of different stages."
> - Student volunteer, 2017

> "This is fantastic as knowing new people from various degree pathways exposes you to each of your potential options in the future, as well as encouraging discussion about topics you yourself may not have experienced."
> - Student volunteer, 2016

Developing communication and presentation skills

Throughout the three series, students have reported an increase in their confidence to present their mathematical knowledge - an important skill highlighted by the Higher Education Mathematics Curriculum Summit (Groves, 2012). Asked to reflect on their experiences students have responded:

> "Overall, I thought Maths Sparks helped me to explain ideas and concepts. I really learned how to break ideas into their simplest form so that they could be easily explained and understood."
> - Student volunteer, 2017

> "I feel that I've learnt to communicate my own ideas more coherently and concisely."
> - Student volunteer, 2017

> "I feel I am much more confident in my approach to communicating maths."
> - Student volunteer, 2016

Participation in the programme has also had a positive impact on their skills in facilitating pupil learning:

> "I have learned better techniques in assisting learners and trying to get them to figure out things for themselves without giving the answers"
> - Student volunteer, 2017

Figure 5: Student volunteer working with pupils during Maths Sparks 2017

Team-work

Participating in Maths Sparks has assisted students in learning more about working in a team. While students have commented that there is a "great team spirit among facilitators" (Student volunteer, 2017), students appear to have developed their collaborative and cooperative skills:

"I really enjoyed working in a team with people with very different interests to me... there aren't many opportunities to work in a team while studying maths at third level so it was enjoyable to take part in something like this."
- Student volunteer, 2016

"Working with others has shown me that the overall result of a group is greater than the sum of the individual parts...different people have different strengths and each member adds a unique part to the overall project."
- Student volunteer, 2016

"Preparing for the workshops in a team meant I had to have confidence in the other team members to complete their work as well as the responsibility of my own work."
- Student volunteer, 2016

Figure 6: Students and pupils investigate the properties of a Möbius Strip

Recommending the programme to other students

The vast majority of student volunteers would recommend this programme to their peers because of the skills they feel they have gained.

> "I would recommend others to take part as it is a very enjoyable and rewarding experience. I have learned so much from these last few weeks that I can use again both in college and work."
> - Student volunteer, 2017

A number of students have commented on how their participation has assisted them in work interviews, since their experiences have provided them with contexts to discuss their ability to communicate mathematics and work as part of a team.

> "I've had several interviews and all interviewers have had an interest in this programme."
> - Student volunteer, 2017

However, the workload requested of volunteers is something to keep in mind and is an issue we hope to address in future years with further advanced preparation of workshop content.

> "Workload may be stressful around mid-term exams, but overall very manageable."
> - Student volunteer, 2017

It is important to note here that student volunteers are recognised for their participation in each of the Maths Sparks: Problem Solving Workshops with an addition to their transcript and (from 2017) with a digital badge awarded by UCD.
Finally, we would like to conclude with reflecting comments from one student volunteer in 2017:

> "I would love to do this again! The enthusiasm from the other UCD students and the pupils themselves is infectious."
> - Student volunteer, 2017

Advice to others for implementation

- While this programme has been situated within the School of Mathematics & Statistics, a similar initiative could be run in other subjects. We have developed a resource book which gives an overview of the initiative and also details the problem-solving tasks used with students. This resource, as well as a video documenting the 2016 programme, can be found on the Maths Sparks website and may be of interest to others who wish to develop a similar programme.
- We highly recommend that students apply to volunteer through an application process where they articulate their reasons for wanting to participate in the programme.
- Communication with schools would not have been possible without building on the relationships with schools and teachers developed by UCD Access & Lifelong Learning. Also, since this programme targeted pupils from DEIS schools, it was important to arrange transport to and from schools directly to UCD - UCD Access & Lifelong Learning played a key role in organising this transport.
- As the workshops are held after school, it was important to provide refreshments in the form of sandwiches, water and snacks to attending post-primary pupils.
- While developing the initial Maths Sparks: Problem Solving Workshops programme took an investment of time, we have found it of benefit in developing a student-staff community within our school. In addition, it has proven to be a very positive experience for undergraduate students who have opportunity to communicate and share their passion for the subject and also work with their peers within the school.

Acknowledgements

Funding of this programme plays a key role in providing transportation, refreshments, and workshop materials. We are very grateful to SFI Discover, UCD Access & Lifelong Learning, UCD College of Science, and the UCD School of Mathematics & Statistics for their continued support of this programme.

More information on Maths Sparks and resources available for download can be found at: **https://www.ucd.ie/mathstat/mathsparks/**

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SECTION

3

Assessment

Chapter 9: “It is really difficulty to read scientific papers” - Teach me how!

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Introduction

A very high proportion of University students, including science students, leave their undergraduate degrees with limited ability to read or critically evaluate research papers. By the time students reach their last year of an undergraduate programme they should be capable of dissecting a research paper in their field of study. With appropriate strategies and encouragement there is no reason this cannot be achieved in the majority of cases. Using this final year neuroscience module as an example and through the implementation of Universal Design Principles, we decided to improve each student’s ability to read and understand scientific papers in the module topics we teach. The student thus learns about the module topics by extracting the information from relevant scientific papers. We use flexible tools and collaborative and interactive learning.

Figure 1: Relaxing with a scientific paper

Module Name	NEUR40020 Synaptic plasticity
Universal Design Principles	- Equitable use - Flexibility in use - Community of learners
Discipline	Neuroscience
Level	UCD level 4
College	Science
Learning Outcomes	**On successful completion of the module students should be able to:** - demonstrate an understanding of scientific papers in general and in this topic. - critically evaluate recent research findings in this field. - discuss the application of modern research methods to studying problems in this topic.

Why Universal Design for this module?

For most programmes in university, it is now good practice to embed research into teaching. This entails the reading and understanding of research papers and is of utmost importance especially in the sciences. Many students struggle with this activity and leave university unprepared in comprehending even the simplest of scientific papers. Whilst there is a vast literature out there purporting to show students how best to do this, it is largely unsuccessful and does not utilise Universal Design. Students in their early years studying science will often come out with:

> "Nothing makes you feel stupid quite like reading a scientific journal"

Sinead Lanigan, a 3rd year PhD neuroscience student states:

> "Learning to read scientific papers in this module really helped me to understand the papers I now have to read during my PhD"

Laura Batti, a Post Doctoral Fellow previously said:

> "It was absolutely vital to have been prepared to dissect research papers before I began my PhD and now post doctoral career"

We therefore set out to create a module that would both cover the topics required (synaptic plasticity), and also use the principles of **Equitable use** and **Flexibility in use** to guide the students in understanding Science research papers. Specifically we set out to achieve **Equitable use** for students with different ability levels in reading and make the module appealing to all. To achieve **Flexibility in use** we carried out a number of assessment methods allowing for a different pace for different users, open book assessment, home and in class exercises and minimal lecturing. Students might have asked: why bother to read scientific papers? We emphasized that it is imperative for a graduate student to be able to read and understand a scientific paper so that they can:

- write their own scientific papers
- better excel at research during postgraduate degrees
- obtain jobs more readily in publishing
- improve their future teaching skills
- allow them to keep up on modern advances in science

Design and implementation of the initiative

Many students read a scientific paper and then say:

> "I didn't understand one sentence of it"

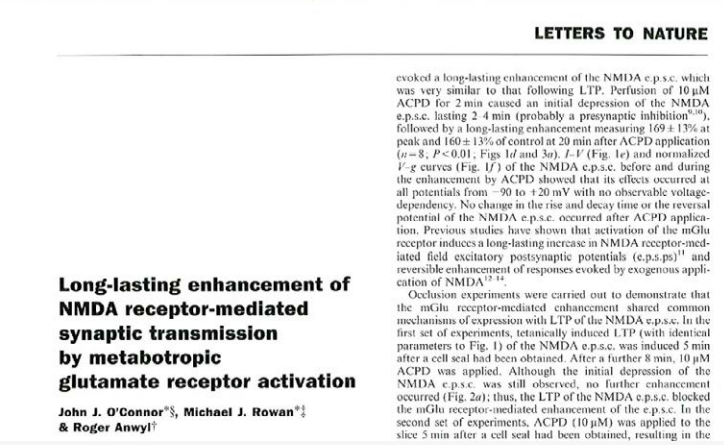
or:

> "How could any human brain produce such sentences?"

Whilst there is an enormous amount of literature on this topic most publications do not consider a Universal Design approach. One of the key aspects to the design of this module was flexible and group learning through a **Community of learners**. For a successful outcome students must be offered a number of learning tasks some to be carried out in groups and others individually.

Teaching & learning strategies

Many students feel overwhelmed when they look at the title of a paper never mind the abstract or results! Some of the highest impact journals can be the most dense to read. There will always be something they don't understand in a paper.



LETTERS TO NATURE

Long-lasting enhancement of NMDA receptor-mediated synaptic transmission by metabotropic glutamate receptor activation

John J. O'Connor*§, Michael J. Rowan*‡§ & Roger Anwyl†

evoked a long-lasting enhancement of the NMDA e.p.s.c. which was very similar to that following LTP. Perfusion of 10 μM ACPD for 2 min caused an initial depression of the NMDA e.p.s.c. lasting 2–4 min (probably a presynaptic inhibition[9,10]), followed by a long-lasting enhancement measuring 169 ± 13% at peak and 160 ± 13% of control at 20 min after ACPD application ($n = 8$, $P < 0.01$; Figs 1*d* and 3*a*). *I–V* (Fig. 1*e*) and normalized *V–g* curves (Fig. 1*f*) of the NMDA e.p.s.c. before and during the enhancement by ACPD showed that its effects occurred at all potentials from −90 to +20 mV with no observable voltage-dependency. No change in the rise and decay time or the reversal potential of the NMDA e.p.s.c. occurred after ACPD application. Previous studies have shown that activation of the mGlu receptor induces a long-lasting increase in NMDA receptor-mediated field excitatory postsynaptic potentials (e.p.s.ps)[11] and reversible enhancement of responses evoked by exogenous application of NMDA[12–14].

Occlusion experiments were carried out to demonstrate that the mGlu receptor-mediated enhancement shared common mechanisms of expression with LTP of the NMDA e.p.s.c. In the first set of experiments, tetanically induced LTP (with identical parameters to Fig. 1) of the NMDA e.p.s.c. was induced 5 min after a cell seal had been obtained. After a further 8 min, 10 μM ACPD was applied. Although the initial depression of the NMDA e.p.s.c. was still observed, no further enhancement occurred (Fig. 2*a*); thus, the LTP of the NMDA e.p.s.c. blocked the mGlu receptor-mediated enhancement of the e.p.s.c. In the second set of experiments, ACPD (10 μM) was applied to the slice 5 min after a cell seal had been obtained, resulting in the

Figure 2: An example of a compact scientific paper, Nature

The journals, Nature (Figure 2) and Science, two of the highest impact journals in the world, are indecipherable to most students at undergraduate level. Students starting off with less scientific vocabulary will be aided by their fellow students. Remember no student is an expert in reading scientific papers when they start this module.

Of course some help is available to students on-line such as from the journal Science or the publisher Elsevier or other journals but these are not always the most helpful to a diverse group of students with varying educational backgrounds.

Bring in a PhD student

Bring in a current or recently graduated PhD student to discuss their experiences of how they learned to read papers and the importance of this activity to their career. Get them to go through a sample paper with the students and draw it out (Figure 3). It is important that these undergraduate students get to hear how important this skill becomes for so many graduates.

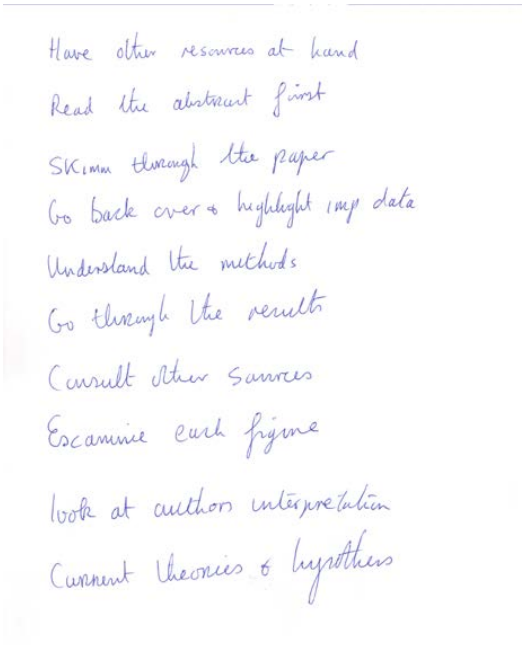


Figure 3: Draw out the research paper such as that described above

Group work

We placed students in groups of 5-6 for presentation of papers and posters. In this exercise they will learn from each other, the tutor and the lecturer helping to create a **Community of learners**. Many students have difficulty with workload management and are over assessed. Within this group work we structure a small number of papers to read. As well as being assessed in group work, questions are asked in the end of semester exams that will require knowledge of these papers. The group as a whole presents the paper as a poster or as individual figures. Each might tackle a single results figure, methods or summary. The tutor awards a group mark and the students award individual marks to each other.

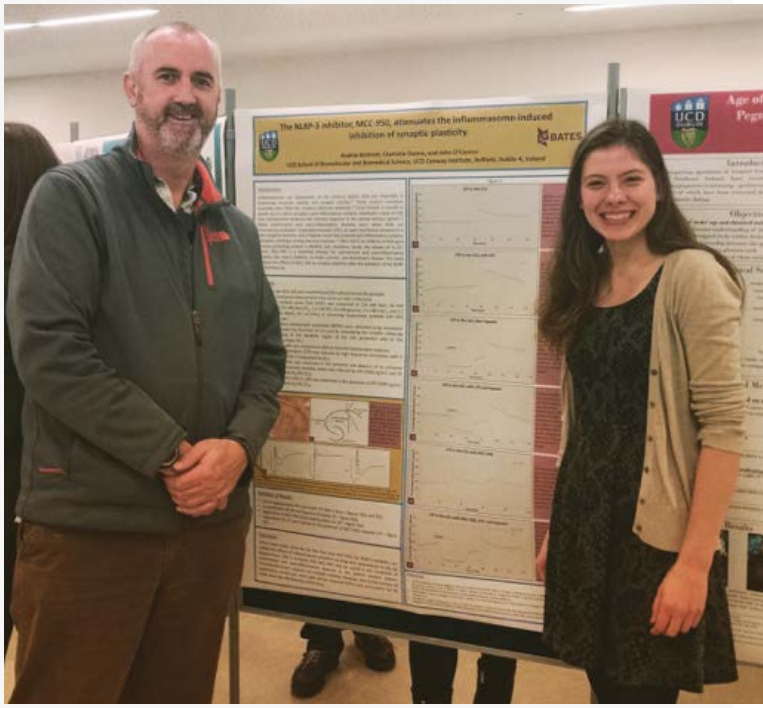


Figure 4: Assessing a fourth year student at her poster

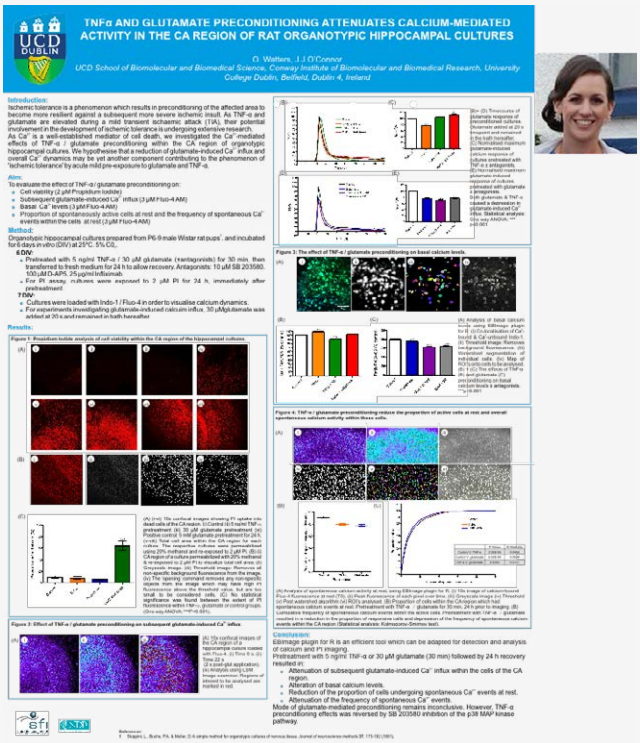


Figure 5: Orla Watters, a 4th year Neuroscience student, summarises a paper as a poster

Journal clubs

Using the 'Journal club' style to read and present papers informally at group meetings each week will help students reach competency more quickly and give them more confidence. Science students do not normally carry out this activity until they join a laboratory at masters or PhD level. Again as an incentive to attend these sessions and read the papers students are informed that the content of these papers is examined in the final exams.

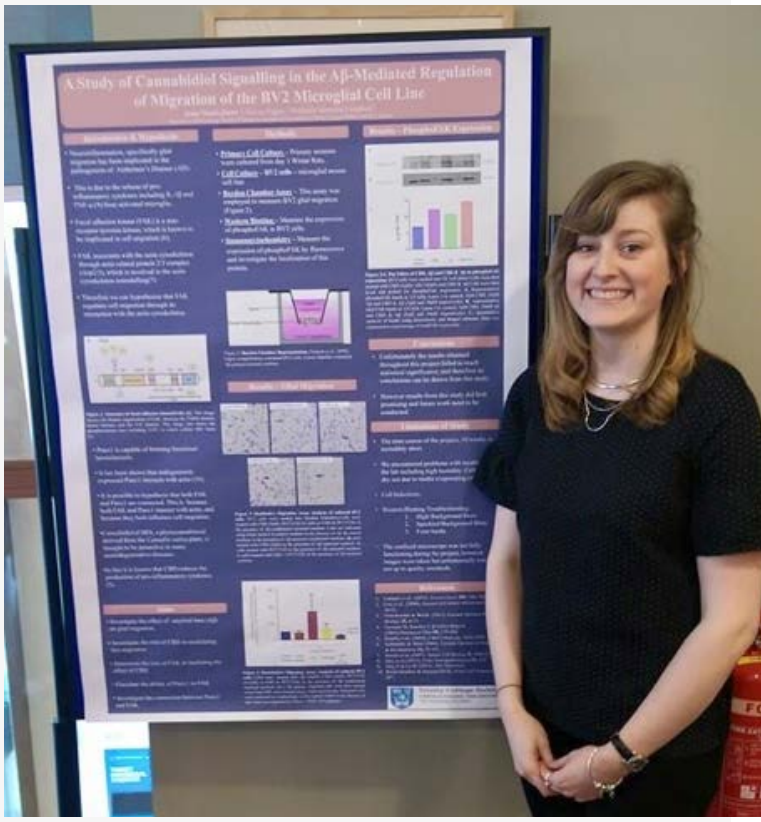


Figure 6: Anne Marie Howe presents her Poster at a journal club

Alternative assessments

Open book assessment

This alternative assessment may be taken by students who do not wish to present a paper. It is unfair to expect students to have similar ability when it comes to this skill. An open book assessment in the middle of the semester allows for **Flexibility in use**. Students are given a science paper to read two days before the assessment. On the day they bring in the paper and any other notes, books and computer they wish. They have 30 minutes to answer 5 questions about the paper. It is my observation and to my disappointment that these type of assessments are rare. The five questions asked of the paper depend on an understanding of the paper so it is a very successful assignment.

Summary of paper

Again for students not comfortable with presenting their paper in a group they might choose to write a 500 word summary of the paper in their own words in a class period. An important strategy to these assessments is that the student understands that the papers are all relevant to the material on the course and can be used in the final exam.

Figure 7: Fourth year Neuroscience students prepare to summarize a paper in 500 words

Final exam

A final 2 hr exam takes place at the end of the semester on the module 'synaptic plasticity' and students will know that a knowledge of all of these papers is imperative to do well.

In summary all of these assessment strategies are employed to ensure the students have strong scaffolding surrounding their learning and that they are not over assessed either in groups or as individuals.

How do you know it worked?

At the end of this module students are more relaxed about reading scientific papers. This can be observed by their ability to discuss new papers at the end of the course. Since this strategy was brought in three years ago the feedback from the students has dramatically changed.

Prior to design change:

"I hadn't got a clue what this module was about"

"I can't understand a word in those scientific papers"

Post design change:

"The module introduced me to the importance of reading scientific papers"

"The way in which the lecturers went through papers to explain them in detail was of help. The lecturers' lack of lecture slides and a focus on papers instead was something I found good as well."

"The research paper exam is a very good idea in the first few weeks as it gets you used to going through research papers and also takes some of the pressure off final exams"

"Reading papers in class helped me start understanding how to read papers."

Advice to others for implementation

In general sending a single undergraduate student off with a difficult scientific paper and expecting them to come back the following day with an understanding of the paper does not work.

Reading journal papers is an essential skill for every discipline and for every year of study. It should ideally be progressed from first year of university to the last year. The key issue is that it is not explicitly and frequently taught through the years. Readers are invited to consider how they could interpret reading journal papers into their classroom teaching and may want to include some of the following strategies:

- Be flexible and use multiple assessment strategies.
- Introduce basic understanding principles on how to read papers first.
- Give the best practice guidelines on how to read papers.
- Use a PhD student to tell their story on how they grew in ability to read science papers.
- Use Group work to get students to gain confidence.
- Use Open book assessments.
- Get students to present papers as posters in groups.
- Finally integrate the papers they have read into their final exams.

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Chapter 10: Facilitating Students to Proudly Showcase their Research: Embedding the Presentation of Student Research into a Part-time Business Degree

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Figure 1: Student Research Expo

Introduction

Making academic research enjoyable, fulfilling, developmental and achievable seemed crucial to this cohort of students. Adopting the concepts of Universal Design within this module appeared to give us the opportunity to do this.
This assessment was selected to deliberatively showcase the marriage of experiential learning with academic learning which part-time students demonstrate so well. The Bachelor of Business Studies begins with a Level 7 60 ECTS diploma qualification covering the bedrock of business functional areas. Students can then progress to two further 60 credit stages comprising the Degree stages which provides them with a Level 8 degree award.

The students on the programme are aged 21 and above, with an average age of 34. Many students have moved into middle management positions or are starting to move up the career ladder and are motivated, focused and engaged.
Students are expected to take a more analytical and research-focused overview of their topics as they move into the Degree stages and topics include strategic management, entrepreneurship and project management.

The programmes provides an introduction to research through the module 'Undergraduate Dissertation' which allows the students to research a practical problem from an academic perspective, as these students have strong practitioner insights which allows them to explore theory from a practical perspective. The opportunities for the students to not only explore the academic theory of this topic but to share their findings with their peers and the academic community seems to be a natural progression for the introduction of the poster presentations.

Module Name	BMGT3002D Undergraduate Dissertation
Universal Design Principles	- Flexibility in use - Tolerance for error - A community of learners - Instructional climate
Discipline	Management
Level	UCD level 3
College	Business
Learning Outcomes	- Evaluate different research methodology approaches and identify the most suitable approaches in different situations. - Conduct interviews and/or administer surveys for the purposes of research. - Explore the key themes arising in the literature and to demonstrate how these themes are applicable in the chosen research site. - Understand the various ethical considerations when undertaking research. - Evaluate research findings and be able to identify the most relevant findings. - Present a clear discussion of the main research findings and be able to put forward appropriate conclusions based on the findings.

Why Universal Design with this module?

Profile of our students

The prior involvement in education by students on the programme is varied. Many students on this programme have already attained certificates and diplomas in specialist areas of business and are looking to copper fasten their experience and knowledge with a degree.

However others may not have enjoyed formal education or learning in an academic environment. The flexible entry route to the programme allows students to commence the programme once aged 23 years or over and having demonstrated a suitable consideration of the programme at interview. The work experience and personal stories of each of the students provides them with a unique insight into the programme material and how it can help their professional development.

Design and implementation

The students' experiential learning complements the classroom experience and provides them with a platform to explore the academic material from a range of aspects. For many students it is their first experience of Higher Education and the programme team is very cognisant of the challenges inherent in returning to education. This incremental and embedded approach to academic skill development allows **Tolerance for error** and culminates in the ability to present a poster on their own research at the end of the degree.

Academic skills modules are introduced in Year 1 and then are progressively scaffolded into curriculum design across the degree programme and can be itemised as follows (Irving, 2011):

- During Year 1 Stage 1, students undertake two 5ECTS modules intended to introduce and advance critical thinking. The Semester 1 module 'Introducing Academic Competencies' introduces the key academic tools needed at university e.g. essay writing, information literacy, exam technique. The concept of critical thinking is introduced too. In Semester 2, students undertake 'Developing Academic Competencies' which explores critical thinking in more depth and introduces reflective writing.

- For Year 2, students have an opportunity to undertake a module called Business Project. In this Business Project module, students develop their critical thinking skills by conducting a review of a particular business environment of their choice and a short, peer-assessed poster presentation in class.
- For Year 3, students undertake 20 ECTS on critical thinking skills with the Management Practice modules. In semester 1, students have an opportunity to enhance their critical thinking skills with Management Practice 1 which is the identification of a topic and a literature review on this topic. In Semester 2, students continue with the topic and research the topic in their organisation by completing two interviews, analysing the interview findings and drawing conclusions.
- For Year 4, students then undertake a 20 ECTS module entitled 'Undergraduate Dissertation'. This is outlined below.

UG dissertation module final year

As part of the final year of study, students have an opportunity to conduct a small piece of research on a topic of their choice, thus helping them to develop research skills in their chosen field allowing for **Flexibility in use**. This is a core module of 20 credits and is part of Stage 3 of the Bachelor of Business Studies. The dissertation provides students with an opportunity to demonstrate their ability to identify, collect, organise and analyse data and to systematically develop a cohesive argument to address a particular research topic with some minor primary data collection. The project culminates with a Research Expo day which is worth 10% of the project. The Research Expo provides students with an opportunity to use a poster to showcase their work to classmates, faculty, programme staff, family, friends and employers in a positive **Instructional climate**. A panel of judges circulates to evaluate the posters.

In addition to the academic requirements, the use of the poster presentation in the atrium of the UCD Lochlann Quinn School of Business provides a sense of occasion for the students as they present their work and share with their peers in a **Community of learners**. This afternoon is also the students' last day on campus for the programme.

The inclusion of family, employers and other supporters might be perceived as a witness to a rite of passage in many respects where the students' supporters can come and observe the student as they engage with the academic community on a topic of their selection. A reception is available just prior to the start of the Expo and academics, students and staff mix together before formal judging commences as this too also builds a sense of community.

Topic 14:
Preparing a poster presentation

Recommended readings:

North Carolina State University. 2013. Creating effective poster presentations. [Online] . [Accessed 13 April 2017]. Available from: https://projects.ncsu.edu/project/posters/ExamplePosters.html

On completion of studying this topic, you should be able to:

The class will take part in four distinct debates and will be split accordingly into different groups. The groups will rotate through the debates and take on different roles during each debate.

In any of the three debates the class groups will take on one of these categories:

- Understand what a poster presentation is.
- Understand the key features of a poster presentation.
- Understand the nature of poster presentation session for the BBS Undergraduate Dissertation.

Figure 2: Sample of student advice regarding poster presentation

Benefits to the student

By using a poster presentation as part of the assessment for the 'Undergraduate Dissertation', students have the opportunity acquire specialist knowledge and also develop transferable skills including project management, time management, data analysis, report writing, poster production and poster presentation. In student feedback*, 75% of respondents either agreed or strongly agreed with the statement: "My research will help me with my career".

Over the academic year the academic support officers and Programme Director discussed the transformative nature of education and research and the Centre for Distance Learning captured this on video. The students discuss how their research and engagement with the programme gave them confidence in discussing workplace related topics.

The module appears to have helped to demystify the research process for students (Healey and Jenkins, 2009) and it is likely that it has encouraged them to pursue further studies. 95% of the survey respondents either agreed or strongly agreed with the statement: "I plan to undertake postgraduate study in the future". Furthermore:

- The Research Expo demonstrates that being a part-time student and completing a research project can be socialised learning experiences. The use of a poster for assessment purpose enabled this.
- It is a particularly effective means for students to distil their key research findings and display them visually.
- The event has been a very successful way to assess the students' understanding of the research process.
- Students have enjoyed the opportunity to discuss their research and engage with their peers on their research topics, representing a very positive culmination to the students' research endeavours.
- Academics can see the breadth of work and research undertaken by students

Figure 3: Students discussing their research at their posters

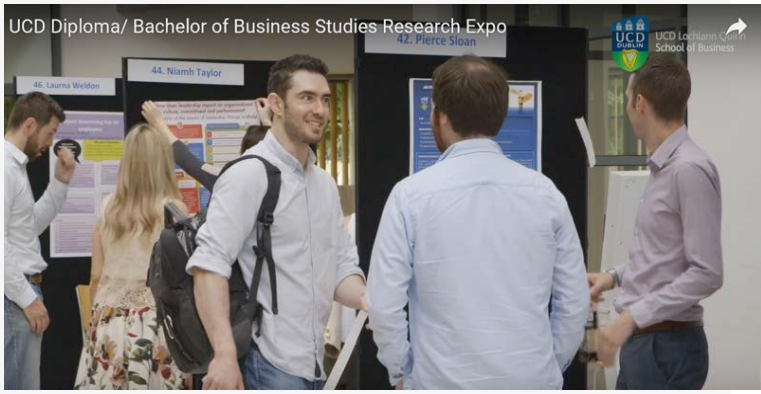

Figure 4: Posters at the Research Expo 2016

Comments from the students include

"the Research Expo... shows you this is what you have done, this is what you have been working for" with one lecturer identifying this event as a "bearing witness" by students' family and friends to their journey through their undergraduate programme.

Students commented that being pushed out of their comfort zone and actively engaging in the research process was challenging and extremely enjoyable with one student noting that they can "talk about work related topics with more credibility" as a result of this programme.

*The survey was completed by approximately 50% of the 43 students to whom it was issued.

Advice to others for implementation

This case study provides an example of the design of assessment which is aligned with the student profile and the purpose of the module overall. The completion of research can be an isolating and frustrating experience for students. The use of a poster presentation demonstrates how the process of research dissemination can be socialised across and within a wider community of University academics and students themselves (Boyer, 1998). There are three key elements of consideration should another practitioner wish to approach this method:

Figure 5: Academic judge and students discussing research findings

1) Student engagement

1. Ensure you survey the student cohort in advance of the process to ascertain feelings around the research process/ doing research which can then be compared to the post research survey to measure impact.
2. Identify through the survey any common inhibitions regarding the process. For example, students are often wary of preparing a poster. A short workshop, information sheet or provision of a sample poster can help to manage expectations.
3. Emphasise the social aspect and culmination of 4 years of study and remind students this is an opportunity to show their peers what they have learnt!
4. The sharing of experience at an event can be very motivating. It can help students to reconsider postgraduate studies which may have been thought inaccessible due to the preconception that graduate studies are linked with research. Have brochures for graduate study available.

2) Posters

1. Ensure that the poster element is given proportionate attention during the year and differing levels of design suggestions are given.
2. Ensure guidance is given to students on suggested visual impact techniques, poster layout guidelines and how you want to "showcase" your findings.
3. Ensure judges are a mix from different disciplines as the student must be able to transmit the content of the research and the import of the findings concisely to the judge regardless of background.

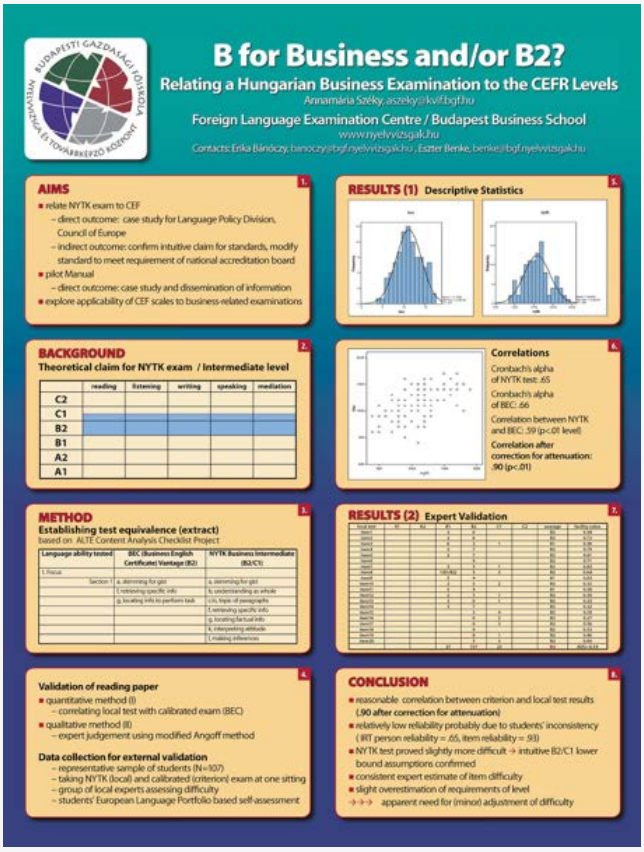

Figure 6: Sample poster layout from Study Guide

3) Logistics

1. Publicise widely across university and within department/College/University.
2. Ensure "event organisation" protocol is observed and everything is planned and co-ordinated preferably by a dedicated member of staff to ensure a relaxed atmosphere and full enjoyment by students and visitors.
3. Ensure lots of professional imagery and reusable resources are taken to capture the event as these might be used to promote the benefit of this event/ approach in the future.

References and resources

Boyer Commission on Educating Undergraduates in the Research University. (1998). Reinventing undergraduate education: A blueprint for America's research universities, CA: Carnegie Foundation for the Advancement of Teaching.

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Healey, M. and Jenkins, A. (2009): Developing Undergraduate research and inquiry, York Higher Education Academy.

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Waite-Connor, C. (2004) US Geological Survey The poster session: a guide for preparation. Available at: **http://associations.sou.edu/aaaspd/PosterPrep.html** (Accessed 20th April 2017).

Chapter 11: Debating – How to advance your students' communication abilities

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Introduction and context

Many scientists are averse to communicating science at a basic and understandable level with non-scientists; this has been a key issue with how the climate change argument has progressed in recent years. Verbal communication while maintaining composure with someone who may have a diametrically opposing view or opinion can be a significant issue for scientists.

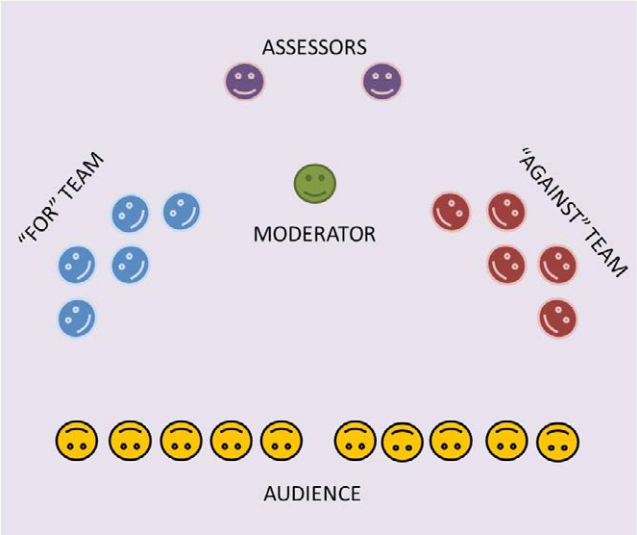

Figure 1: Debate room layout

Module Name	POL41190 Climate Change and Development
Universal Design Principles	- Equitable use - Flexibility in use - Simple and intuitive - A community of learners - Instructional climate
Discipline	Development Practice
Level	UCD level 4
College	Social Science and Law (Dr. Buggy is based in the College of Health and Agricultural Science but provides module coordination for the module as it is jointly run between UCD and Trinity College Dublin)
Learning Outcomes	The module is designed for all students to become conversant and knowledgeable of the science of climate change. Upon successful completion of this component of the module all students (regardless of their abilities coming into the module) should expect to: - Communicate relevant global climate processes and climate dynamics simply - Demonstrate awareness of current relevant climate and development discourses and negotiations - Demonstrate awareness of the main organisations, mechanisms and legislative frameworks through which climate change is being mainstreamed within development strategies at international and national levels - Demonstrate an understanding of climate justice; - Be able to communicate effectively to a wider audience - Be able to self-reflect on how debating is a learning process in its own right

Why Universal Design for this module?

The students undertaking this module come from a wide variety of backgrounds professionally, economically and nationally and many do not have a scientific background. Ensuring that they could succeed in successfully communicating scientific information to such a sceptical audience is our primary aim for incorporating debate into the module. A secondary aim is to make the module more interesting with active participation from all students, as well as ensuring that they could use the debate learning process as a way to self-reflect on what and how they learned through the module.

When students create bodies of work for their assessment that have a specific practical purpose they are learning as they progress through them and such actions are a multisensory experience (Castley, 2006). In this regard incorporating the communication mechanism of debating into the assessment strategy, the learning becomes such an experience. Through active learning in a debate scenario that has a specific purpose, students directly discover how knowledge can be utilised, and that through observation of knowledge in action the student does not have to rely on their lecturer's knowledge (Jenkins et al., 2003).

This class exercise (half day) is a summative form of assessment that leads to a self-reflection assessment for all students. The debate is held on the last day of the module (an intense two week 5 credit module) and is used to demonstrate the student's knowledge of the climate change science they have learned as well as how to effectively communicate climate change information which is often a contentious issue with climate change "deniers". The debate performance is assessed and the self-reflection of the learning process is also assessed (10% for each; 20% of the module grade).

Incorporating a formalised debate into the module as a specified learning activity that is part of the assessment allows all students the opportunity to practice communication of scientific facts regarding climate change to a wider audience. This is useful when one considers that as professionals they may be required to communicate to those that are sceptical of the science of climate change and deny that it is taking place and/or is a result of the actions of man.

The debate instruction is designed to be simple, straightforward and accessible by all students in the class that come from a wide array of educational, professional and national backgrounds with a diverse range of abilities.

Debate protocol

Communication is key to understanding many scientific concepts including climate change. While in a class room setting we can discuss aspects of the scientific and social aspects of climate change in what can be considered to be non-confrontational and safe environments, in the real world communication does not take place under such ideal conditions. Emotions and passions can run high while attempting to transfer knowledge or merely get a point across. Scientific argument can become muddied and diluted as differing agendas take precedent and jostle for position.

Acrimonious dialogue

Often times we find ourselves in situations where we do not have enough time or resources to make a significant argument during a debate or dialogue. Sometimes we are on the periphery of an argument that we cannot input much to, but can judge the argument none the less. Please remember that during a debate even when you think your comment is not worthy of interjection, it will further stimulate the debate in ways you may not understand in advance. That is the whole point of the evolution of a communication process.

The debates

The class will take part in four distinct debates and will be split accordingly into different groups. The groups will rotate through the debates and take on different roles during each debate.

In any of the three debates the class groups will take on one of these categories:

- “The For” Group
- “The Against” Group
- “The Questioning Audience”

Eight groups will be allocated on the second Monday of the module.

So during the three hours of debating, each group will have a chance to take on these roles. Each team must nominate a spokesperson to present a 5 minute team position. A coin toss will determine which team goes first in each debate. Each team can have a 2 minute rebuttal after both teams have presented their initial 5 minute team position. The rebuttal can be by any team member. There will then commence the questions from the audience. In the interest of fairness, no presentation slides will be allowed, this debate will entirely be through verbal communication.

After each question from the audience a single member of the team that is questioned (whoever from the group that considers they can answer most effectively) must answer and the corresponding team must provide a rebuttal.

Each member of the audience must provide at least one question. At the end of the answering of the question the audience member must state which group they consider provided the better answer and why. Questions are permitted for thirty minutes.

For each debate one student from "The Questioning Audience" must volunteer to moderate the debate.

Three members of the academic faculty will be the assessors and will grade each student based on their overall performance throughout the three hours. All three academics may interject as they desire during the course of the debate to add professional perspectives to the debate. The three academics will determine vote with the class to determine the winning side in each debate.

Debate topics

The range of debate topics will be provided on BlackBoard and the class can vote via an online discussion forum on the four chosen topics.

Figure 2: Student debate protocol provided in advance

The debates are for all students working together to prepare and then communicate both individually and as teams during the debate process. This helps to create a productive and positive **Community of learners**. Students vote on debate topics in advance in the online learning environment so they direct the topics they wish to debate. The debate is moderated by three faculty members and occasionally guest academics interested in communication exercises in teaching and in conflict resolution. The debate process takes place in a relaxed and convivial **Instructional climate** but students are impressed upon by their faculty on the expectations for good verbal communication and how to utilise it professionally to effectively engender change.

Design and implementation

When approaching a module design from the outset, irrespective of the delivery innovations, it is the assessment of student's learning which often proves most problematic (Savin-Baden and Major, 2004; Schwartz et al., 2001). Gaining student "buy-in" to any assessment is also a significant factor in how a student responds, while also ensuring that the assessment strategy the students "buy-in" to is aligned with the learning outcomes (Biggs, 2003; North, 2016).

Prior to the commencement of the module students are informed that the concluding day of the module will be one for discourse in the morning and debate in the afternoon. Students are thus prepared for this process well in advance. At the half way point in the module students are provided with a range of potential debate topics in an online discussion forum in a learning management system (e.g. BlackBoard or Moodle). For this module eight arguments were presented for the students to choose from allowing for **Flexibility in use**. Students as a class then are required to discuss and decide which four topics are to be debated. Potentially a vote can be conducted using an online voting tool such as GoogleDocs or Doodle.

Two days before the debate students are randomly selected into groups for each debate regardless of their gender, level of ability, educational or national background. They are placed into three groups for each debate: "FOR", "AGAINST" and "AUDIENCE". Each group has instructions for participation in the debate in the overall debate instructions provided at the start of the module (as seen in Figure 2) making the process as **Simple and intuitive** as possible. Students thus have 48 hours to prepare for the debate and the roles they must undertake. Each student has at least two roles; being in a debate team or being part of the audience.

This allows for **Equitable use** in the distribution of tasks and learning opportunities. The third role is that of voluntary moderator from the audience. Each role is defined in the debate protocol (Figure 2).

The debate should be assessed by a minimum of two faculty members that lecture within the module or are at least familiar with the module and/or the student cohort (Figure 3). The faculty members must commit to a full day of interaction with the students (discourse and discussion in the morning and debate in the afternoon).

Debate assessment

Students were graded on their participation in the debate (10% of the module) via a score sheet (Figure 4 Criteria for grading). Each faculty member acting as an assessor must grade individually. Immediately subsequent to the debate all faculty members convene to compare their assessment and arrive at a grade for each individual student (Figure 5 Debate Score Sheet).

Figure 3: Procedure for assessing the debate

Each of the four debates is 45 minutes in duration. Students must rotate positions in the room after each debate. Figure 1 outlines the layout for the room so it is essential that the debate is conducted in a room that can be reconfigured relatively easily. All students must be visible to each other, so the debate teams must be in staggered formation – in this fashion no student can hide behind another. The faculty members should be outside of the triangle formed between the two teams and the audience. Figures 4 and 5 outline the grading criteria and score sheet utilised by the faculty members for assessment.

Grading criteria

1. Did the student present the opening statement? **Yes / No**
2. Did the student present the rebuttal? **Yes / No**
3. Did the student present the closing statement? **Yes / No**
4. Did the student volunteer to act as a Moderator? **Yes / No**
5. Did the student answer a question posed by the audience? **Yes / No (indicate how many)**
6. Did the student ask a question while being in the audience? **Yes / No (indicate how many)**
7. Did the student ask a question of the opposing team? **Yes / No (indicate how many)**
8. Did the student answer a question from the opposing team? **Yes / No (indicate how many)**

Figure 4: Criteria for Grading

Student	1	2	3	4	5	6	7	8	Comments	Score (out of 10)
John	Y	N	N	N	2	3	1	1	John had a strong opening statement and posed a question to the opposing team while also answering questions. He participated as an audience member. His answers deviated from the team message.	7.0
Jane	N	N	Y	Y	0	0	0	0	Jane made very little contribution to the debate. She did not pose questions or answer any either within the debate or when she was in the audience. Her rebuttal was her only contribution and it was weak. She did however act as moderator for the second debate.	4.5
Chris										
Mary										
Ben										

Figure 5: Debate score sheet (two example students filled in)

At the commencement of the morning discourse and discussion session the Module Coordinator discusses the process of self-reflection for autonomous learners and then directs the student to review the self-reflection instructions and accompanying example that are provided on the learning management system. A self-reflective essay is submitted by the students 48 hours after the debate and is graded (10% of the module) with the provision of feedback. Figure 6 shows some of the instructions provided to students on this exercise. Students are also provided with specified learning activities to assist them in understanding more about self-reflective writing (please refer to the writing resources for students in the References and resources section of this chapter).

Debate self-reflection

500 words ± 100 words
Comprising of a brief introduction, a review of personal experience in the debate preparation and process, your self-realised strengths and weaknesses that were apparent during the process, and a conclusion of what you took from the whole debate process as a form of communication.

Purpose of self-reflection

A great deal of your time at university will be spent thinking; thinking about what people have said, what you have read, what you yourself are thinking and how your thinking has changed. It is generally believed that the thinking process involves two aspects: reflective thinking and critical thinking. They are not separate processes; rather, they are closely connected.

What is reflective writing?

Reflective writing is:

- your response to experiences, opinions, events or new information;
- your response to thoughts and feelings;
- a way of thinking to explore your learning;
- an opportunity to gain self-knowledge;
- a way to achieve clarity and better understanding of;
- what you are learning;
- a chance to develop and reinforce writing skills; and
- a way of making meaning out of what you study.

Reflective writing is not:

- just conveying information, instruction or argument;
- pure description, though there may be descriptive elements;
- straightforward decision or judgement (e.g. about whether something is right or wrong, good or bad);
- simple problem-solving;
- a summary of course notes; and / or
- a standard university essay.

How to write self-reflectively

There are many techniques which can be utilised, but at its most basic you should be able to:

- Describe what happened;
- What was your role?
- What feelings and perceptions surrounded the experience?
- How would you explain the situation to someone else?
- What might this experience mean in the context of the module?
- What other perspectives, theories or concepts could be applied to the situation?

Figure 6: Debate Self-Reflection Instructions

Results: how we know it worked

Based on the participation, the grading process and the comments received in feedback for the debate and self-reflection, the debate process maps with the learning outcomes for the module very effectively:

- Students understand the value of verbal discourse but also of self-reflection;
- Students understand that they must be able to communicate effectively at all levels and with people with opposing opinions and attitudes;
- Students understand the value of self-reflection of the learning process rather than just solely on the knowledge they accumulated in the process; and
- Comments received from the student during evaluation and via email after the module were enthusiastic and all enjoyed it as a learning experience.

Lessons learned include ensuring that all necessary instruction is clear, unambiguous and provided well in advance, that it is a gradable component of the module (the first time the debate was held in 2013 it did not go as planned nor was it graded so students did not participate fully) and that students have a say in the debate topics so that they can self-direct the learning process.

Advice for implementation

This process has been implemented in another module as a non-gradable component with adult learners – it is effective as a mechanism for learning, and enjoyed by them – but they really need to know the value of it professionally in advance. So bringing in external experts from professional bodies to moderate and discuss the process of verbal discourse with them has proven valuable.

Having all of the instructions prepared well in advance and a sequence of learning prepared for the students over the course of the module building up to the debate is essential – if it is a gradable component it should be held at the very end of the module after all of the learning materials have been provided. Also some discussion with the students on the merits of debating and providing them with a purpose for the exercise is critical to get buy in from them. Having the assessment in between 20 and 30% gives the students incentive to take part but doesn't foster nervousness amongst students that may consider themselves weak or afraid to speak up which they would be if the assessment was a higher value.

"In terms of personal growth and learning, this debate was a beneficial exercise as it stimulated informed discussion within the class, both during the debate and in preparation of it. It gave us the opportunity and space to organize and articulate our thoughts, concerns and questions cogently."

RUCHIKA MATHUR

2015 Masters in Development Practice Student

"While undertaking the Climate Change debate, our team were tasked with putting forward an argument as to why all energy and resources should be allocated to tackling reductions in carbon dioxide emissions while completely ignoring the effects of methane and nitrous oxide on the phenomenon of anthropogenic climate change. While putting forward such a polarised and necessarily rigid argument was certainly a challenge, it was also a very useful and practical challenge in order to see how one can strategically shape a message to suit your needs while essentially ignoring or discrediting other important elements of the debate (in this case the effects of other greenhouse gases on global warming)."

PAUL CARR

2016 Masters in Development Practice Student

"All in all, it was an interesting experience. It was a rather short process from start to finish and it was much more relaxed (and couldn't have been otherwise in my case) than previous, long-drawn stressful debates. I must confess I enjoyed more being audience for the other two debates, though, only if because theirs were topics that were very controvertible (crazy, even) and that was fun to play along. Ours was more serious, more in tone with what I would truly ask myself where I stand."

MARIA DEL SOL

2016 Masters in Development Practice Student

2017 Masters in Development Practice Student Kelly Williamson – "I found the debate to be an excellent exercise, for both critical and reflective thinking. I learned a lot about how to formulate a good argument and how to listen carefully to the opposition's arguments (within my group, during preparation, and from my opponents during the debate.) It helped that I was in agreement with the statement that our team was arguing for, but I realized that my big-picture mentality brought a lot to the table and was complimented well by my teammates practical, real-world inputs."

KELLY WILLIAMSON

2017 Masters in Development Practice Student

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Schwartz, P., Mennin, S., Webb, G., (2001). Problem-based Learning: Case Studies, Experience, and Practice. London: Kogan Page.

Writing resources for students

California State University, English Programmes Guide to Self-Reflection
http://english.csuci.edu/program/sampleessay.htm

"KIBIN" Online Essay Writing Tool
https://www.kibin.com/

"The Pen and the Pad" Online Writing Guidance
http://thepenandthepad.com/

Further resources

Universal Design principles / guidelines

- **UDL Guidelines in full-text format** (Word): A complete narrative describing the context within which CAST developed the UDL Guidelines including explanations and examples of each principle and checkpoint.
- **Graphic Organizer - UDL Guidelines** (PDF): A multi-coloured one-page view of the UDL principles and checkpoints.
- McGuire, J. M., & Scott, S. S. (2006). Universal Design for instruction: Extending the Universal Design paradigm to college instruction. Journal of Postsecondary Education and Disability, 19(2), 124–134. **https://www.ahead.org/uploads/docs/jped/journals/JPEDVol19No2.doc**

Implementation of Universal Design in teaching & learning

- Accessible Assessments
- **https://www.jisc.ac.uk/guides/making-assessments-accessible**
- Applications of Universal Design **www.uw.edu/doit/resources/popular-resource-collections/applications-universal-design**
- Burgstahler, S. (2012). Equal access: Universal Design of instruction. Seattle: DO-IT, University of Washington. **www.uw.edu/doit/equal-access-universal-design-instruction**
- Burgstahler, S. , & Coy, R. (Eds.). (2008). Universal Design in Higher Education: From Principles to Practice. Boston: Harvard Education Press.
- Center for Applied Special Technology (CAST) **www.cast.org/our-work/about-udl.html**
- The Center for Universal Design in Education **www.uw.edu/doit/programs/center-universal-design-education/overview**
- Gronneberg, J., & Johnston, S. (2015, April 6). 7 things you should know about Universal Design for learning [Brief]. Educause Learning Initiative. Retrieved from **http://www.educause.edu/library/resources/7-things-you-should-know-about-universal-design-learning**
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- Pliner, S., & Johnson, J. (2004). Historical, theoretical, and foundational principles of Universal Design in Higher Education. Equity of Excellence in Education, 37, 105-113.
- Scott, S., McGuire, J., & Shaw, S. (2003). Universal Design for instruction: A new paradigm for adult instruction in postsecondary education. Remedial and Special Education, 24(6), 369-379.
- UDL Guidelines - Version 2.0: Examples and Resources. **http://www.udlcenter.org/implementation/examples**
- UDL Guidelines - Version 2.0. Research Evidence - **http://www.udlcenter.org/research/researchevidence**

National Forum for the Enhancement of Teaching and Learning in Higher Education resources

National Forum for the Enhancement of Teaching and Learning in Higher Education publications **http://www.teachingandlearning.ie/forum-resources/national-forum-publications/** including:

- Profile of Assessment Practices in Irish Higher Education
- Reaching Out: Why Students Leave
- Transition From Further Education And Training To Higher Education

UCD Access & Lifelong Learning resources

UCD Access & Lifelong Learning Resources for Staff **http://www.ucd.ie/all/supports/informationforstaff/** including:

- Staff training and Universal Design
- Guidelines for Examiners when Grading Scripts
- Staff assistive technology
- Guidelines for Accessibility
- Supporting Students with a Disability

UCD Teaching & Learning resources

UCD Teaching & Learning Resources **http://www.ucd.ie/teaching/resources/** including:

- Teaching Toolkit
- Assessment
- Planning a Teaching Session
- Small Group Teaching
- Strategies
- Large Group Teaching Strategies
- Delivering a Lecture
- Focus on First Year Podcast
- Blackboard: Where to Start?
- Understanding How Students Learn
- Gathering Feedback
- Giving Effective Feedback
- Autonomous Learning

Teaching and Learning in an international context

Arkoudis, S., K. Watty, C. Baik, X. Yu, H. Borland, S. Chang, ... A. Pearce, (2013), Finding common ground: Enhancing interaction between domestic and international students in Higher Education. Teaching in Higher Education, 18 (3), pp. 222–235 **http://dx.doi.org/10.1080/13562517.2012.719156**

Leask, B. (2009) Using formal and informal curricula to improve interactions between home and international students. Journal of Studies in International Education, 13 (2), pp. 205–221 **http://dx.doi.org/10.1177/1028315308329786**

Farrelly, Tom and Tony Murphy (2017) **Transitions of International Students into Higher Education in Ireland. Briefing Paper 1. National Forum for the Enhancement of Teaching & Learning in Higher Education Institute of Technology, Tralee.**

Saunders, Shari and Diana Kardia. **Teaching International Students: Pedagogical Issues and Strategies. Center for Research on Learning and Teaching, University of Michigan.**

Curriculum Design

O'Neill, G. (2015). Curriculum Design in Higher Education: Theory to Practice, Dublin: UCD Teaching & Learning. ISBN 9781905254989 **http://www.ucd.ie/t4cms/UCDTLP0068.pdf** Also available from UCD Research repository at: **http://researchrepository.ucd.ie/handle/10197/7137**

Universal Design for Curriculum Design

Case Studies from University College Dublin

Thank you


References

Universal Design for Curriculum Design

Case Studies from **University College Dublin**

At the core of Universal Design is a focus on variety, choice and feedback for students. Universal Design encourages a movement away from the traditional didactic, text-based classroom practices, embracing of a more dynamic, active and evolving multi-media classroom. This book showcases some of the highly innovation teaching and learning practices in University College Dublin using the framework of Universal Design. The initiatives are in three sections:

- Major Curriculum or Student Support Innovations
- Classroom Teaching and Learning Processes and Materials
- Assessment

You'll find excellent examples of good practice from across a number of different disciplines. In each chapter the authors have provided clear advice on how their initiatives can be implemented by others in Higher Education with a focus on student engagement, retention and success.

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