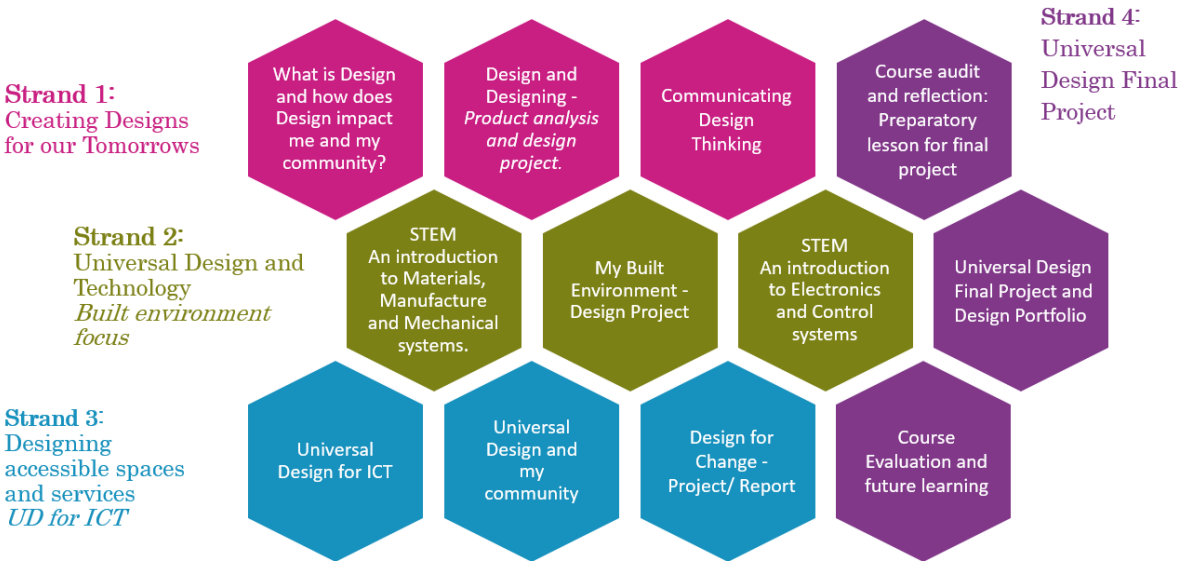
Creating Designs for our Tomorrows

Universal Design Short Course Project

Phase 1 Final Report

2018



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Údarás Náisiúnta Míchumais
National Disability Authority

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Project Background

This report presents the outcomes from a project commissioned by the National Disability Authority's (NDA), Centre for Excellence in Universal Design (CEUD) to develop a Short Course on Universal Design for use in 2nd Level Junior Cycle in Ireland. The project contractor, H2 Learning has developed a Universal Design Short Course titled "Creating Designs for our Tomorrows".

Creating Designs for our Tomorrows is designed to provide an opportunity for second level schools to incorporate Universal Design into their Junior Cycle programme. The Short Course explores the positive contributions a Universal Design approach can have in the community, by enriching student experiences with Products and Services, the Built Environment and Information and Communications Technologies (ICT). It is designed to be delivered in a practical, engaging manner through a combination of human data information, research and analysis tasks, user trials and project design briefs.

This project arose from the statutory remit of the CEUD, to advance the promotion of Universal Design in education in Ireland. As under the Disability Act 2005, Universal Design refers to the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age size, ability or disability. The CEUD promotes Universal Design in education, in standards and through awareness activities. Its key areas of focus are on the built environment, products and services, and Information and Communications Technology.

Introduction of the Principles of Universal Design through education helps to prioritise the awareness and creation of design solutions that reduce the barriers to accessibility and help enable all people to more easily participate as members of society. The 7 Principles of Universal Design inspire design thinking that prioritises people. These Principles are underpinned by 29 Universal Design Guidelines that help to inform design decisions so that design solutions work for the widest possible range of users.

Creating Designs for our Tomorrows is aligned with the Framework for Junior Cycle and the guidelines and specifications for Junior Cycle Short Courses developed by the National Council for Curriculum and Assessment (NCCA) and the Junior Cycle for Teachers (JCT). The course development process involved initial pilot testing of draft course content through focus groups, and teacher workshops. It was informed by input and feedback from stakeholders including teachers, students and academics.

The planned initial piloting of this short course with teachers and schools was impacted by delays associated with Junior Cycle Reform, which curtailed teacher training, new course implementation and assessment procedures in schools. This challenge has provided opportunities to explore alternatives for incorporating *Creating Designs for our Tomorrows* resources into other second level and further education programmes. A range of alternate opportunities have been identified.

This Report outlines the background for the short course and the Junior Cycle context. It discusses the approach taken to developing *Creating Designs for our Tomorrows*. It outlines the stakeholder input and pilot testing carried out. It also covers the content and instructional methodologies that make up the materials prepared as outputs from the project work. Appendices A – E contain information in support of this report, a Glossary of Terms, as well as samples of the curriculum materials developed.

Project Structure

The National Disability Authority's (NDA) Centre for Excellence in Universal Design (CEUD) contracted H2 Learning following an open tender process to develop a Junior Cycle short course on Universal Design along with provisional plans for a rollout at Second Level. The project was expected to entail two Phases of deliverables:

Phase 1: Develop a new Junior Cycle short course prepared as a complete Teacher Resource Pack to support student learning and ease of use by students and teachers. Prepare related support materials for pilots and recommend next steps.

Phase 2 (Provisional): Initiate the rollout of the Junior Cycle short course including the preparation of Master Trainers, training teachers and supporting the trained teachers as they start to teach the short course. The Trainer Resource Pack containing a complete set of rollout materials is to be prepared.

The Methodology for the Short Course Development

Feedback to the CEUD from 3rd level educators based on previous Universal Design education projects and opportunities at 2nd Level provided the basis for this project. Feedback from education workshops and outcomes from rollout of Universal Design at 3rd Level indicated that Universal Design is important and can complement numerous subjects. However, the feedback also indicated that the basics of Universal Design should be introduced to students at an earlier stage in their education.

Also informing the project planning was an opportunity to introduce new curriculum material at 2nd Level following the introduction of short courses in the Junior Cycle. Junior Cycle Reform introduction of Short Courses allows for a school to replace one

subject with a combination of two Short Courses. A short course could offer the necessary time for embedding the Universal Design content as a subject in second level with potential to compliment affiliated subjects in the later education of the students.

The project methodology for the development process of the Short Course was framed to align with Junior Cycle template and guidelines developed by the National Council for Curriculum and Assessment (NCCA) and the Junior Cycle for Teachers (JCT). The basis for the core content for this new Universal Design short course was informed by a set of lessons from a CEUD managed project that piloted a module for second level at Transition Year (TY) titled, *Designing our Tomorrow – Universal Design*[1] *(DOT-UD-TY)* and from existing CEUD curriculum content developed for use with third level. The project methodology followed in Phase 1 involved:

- Clarifying the background and objectives for the Short Course.
- Research alignment of Universal Design with Junior Cycle Reform.
- Establishing a Short Course Specification in-line with NCCA Guidelines.
- Working through best practice curriculum development activities.
- Pilot testing and engaging with stakeholders for feedback through revisions.
- Preparing complete curriculum materials for use in education structures.
- Providing guidelines for use of the curriculum by teachers and schools.
- Exploring other opportunities for alignment and use of the curriculum.
- Preparing a project report with recommendations for next steps.

Throughout the development of the short course for Junior Cycle, stakeholder meetings and trials of the draft short course content were completed. Draft short course materials were used for trials in classroom settings, in conference presentations and at a Further Education Awareness Workshop. Learning from stakeholder meetings and the trials of early draft curriculum guided further development of the short course.

The initial stakeholders from second level included representatives from organisations such as: Technology Teachers Association (TTA); Irish Architecture Foundation (IAF); The Irish Computer Society (ICS); and students and teachers at Castleknock Community College. Because of delays that were affecting advancing Phase 1 of the project, it was decided to expand the scope of stakeholders and look for opportunities to use parts of the curriculum materials in other education settings. Collaboration with the Curriculum Development Unit (CDU), Further Education Support Service (FESS) advanced to operating an Awareness Workshop that informed recommendations in support of using some of the curriculum in Further Education courses.

[1] Designing our Tomorrow: https://www.education.designingourtomorrow.com

Universal Design Short Course Project Output from Phase 1

Creating Designs for our Tomorrows is designed as a practical, active and organic 100-hour short course for the Junior Cycle School Programme. It includes complete sets of lessons, teaching resources and support materials required to deliver Universal Design-focused projects in a practical and engaging manner. Each lesson plan in the short course specifically identifies the relevant learning outcomes, statements of learning, key skills, and assessment associated with that lesson.

The *Creating Designs for our Tomorrows* short course is structured as a set of four strands that can be taught in a number of ways:

- the four strands can be taught as a Junior Cycle short course on Universal Design;
- one or more of the strands can be taught as stand-alone modules;
- or, aspects of the course can be taught to support other Junior Cycle, leaving certificate and further education courses which have curriculum requirements such as; design thinking, creativity, accessibility in Architecture, ICT and STEM subjects.

The short course has four strands (find a full Short Course Outline at Appendix C).

- **Strand 1: Creating Designs for our Tomorrows**
  What is, and how does Design impact me and my community?
  Design and Designing – Product analysis and design project.
  Communicating Design Thinking.

- **Strand 2: Universal Design and Technology**
  STEM - An introduction to Materials, Manufacture and Mechanical systems.
  My Built Environment - Design Project.
  STEM - An introduction to Electronics and Control systems.

- **Strand 3: Designing accessible spaces and services for ICT**
  Universal Design for ICT
  Universal Design and my community
  Design for Change Project/Report

- **Strand 4: Universal Design Final Project**
  Course audit and reflection: Preparatory lesson for final project.
  Universal Design Final project and Design Portfolio.
  Course Evaluation and future learning.

Figure 1 below illustrates a course structure to show how the four strands are combined to form the full short course. However, each strand is a self-contained unit and can be taught separately as a part of another course, depending on the preference of the teacher and the school.

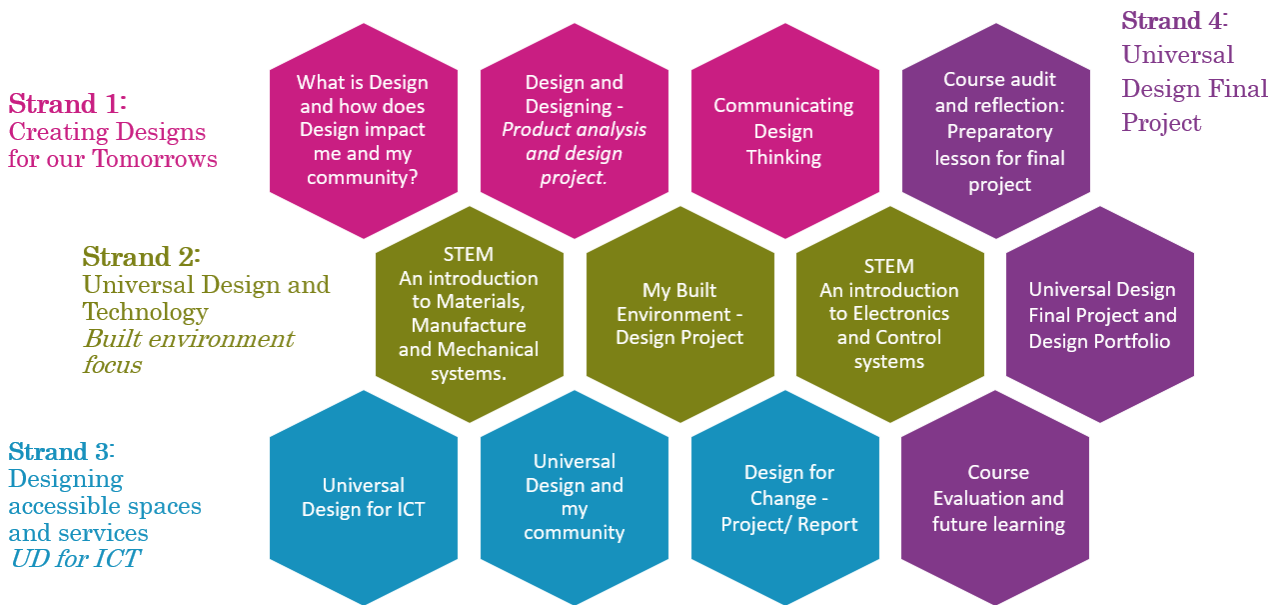

Figure 1: Creating Designs for our Tomorrows Course Structure

Conclusions of Authors

The resolution of the Industrial Relations dispute has reopened the opportunity to promote and integrate Creating for our Tomorrows into the new Junior Cycle offering at post-primary level.

A partnership with the Junior Cycle for Teachers Support Service would provide a strong basis to promote *Creating Designs for our Tomorrows* as a short course option for post-primary schools.

There is growing awareness of Universal Design and requirements for UDL training for teachers at primary, post-primary and further education and training levels.

Elements of the short course content can be adapted for use in First Year to provide a Taster Module to allow students to sample the short course and at Transition Year to introduce Universal Design.

Engagement with Further Education and Training Principals and Senior Management has highlighted opportunities for Universal Design to be incorporated in the programmes and courses in this sector.

Recommended Next Steps for Short Course Phase 2 – Rollout

At the time of writing this report the Junior Cycle for Teachers Support Service (JCT)[2],

[2] JCT Short Courses: http://www.jct.ie/shortcourses/shortcourses.php

indicates that it is establishing a Junior Cycle short course support team, which will promote the use of short courses by schools and will visit schools and advise on the set up of short courses by schools. *Creating Designs for our Tomorrows* is a complete short course that is ready to go which creates an opportunity for it to be considered by the JCT as an example by their team.

Based on the work in Phase 1 of this project and a current readiness to integrate Short Courses in the Junior Cycle, the timing is optimal for initiating the Phase 2 rollout at second level. To plan a Phase 2 rollout to second level schools, the next action steps recommended for the 2018/19 school year should include:

- Establish a partnership with the Junior Cycle for Teachers (JCT) Support Service.
- Prepare a group of master trainers who will be available to deliver CPD workshops at teacher education centres along with online tutorials for teachers.
- Conduct CPD workshops to develop awareness of Universal Design at post-primary level using sample lessons from the course.
- Establish a community of champions based on teachers who express interest in running the short course in their own schools
- Optimise the short course materials for online delivery for teachers to easily use this course in their schools.
- Host a series of periodic webinars to develop and sustain the community of practice and prepare for continued expansion of rollout.
- Identify 12 schools to begin piloting elements of the short course in preparation for rollout in the 2018/19 school year.
- Collect testimonials from principals, teachers and students, which can be used to promote the short course to other schools.
- Develop a promotional flier for use on social media and a webpage to promote the course to prospective teachers.
- Formalise on-going administration and maintenance of the short course including the provision of on-going feedback from users so as to maintain a high-quality service to schools.

Phase 1 stakeholder feedback has identified relevant uses of the course content in Further Education and with evolving Universal Design for Learning (UDL)[3] initiatives. The adaptable structure and accessible format embedded into the short course materials align with the principles of UDL that facilitate multiple means of representation, expression and engagement. Introduction of the Short course materials to other stakeholders has highlighted that the content and structure of the materials developed to introduce Universal Design as a topic, would be readily applicable to compliment a variety of subject areas.

[3] CAST Universal Design for Learning: http://www.cast.org/our-work/about-udl.html#.WuNF3lWnHGg

To optimise the uptake of the Phase 1 Short Course materials, it is recommended that work is done on exploiting opportunities to adapt the short course materials to develop and deliver Further Education modules to promote Universal Design in relevant fields of study. For optimal efficiencies and impact, the following action steps should be operated in parallel with the above action steps for Junior Cycle, to include:

- Engage with Education and Training Boards, which have responsibility for Further Education provision.
- Prepare (train) the master trainers who will be available to deliver CPD and support to potential Further Education practitioners.
- Provide workshops for principals and senior managers in Further Education colleges.
- Package the relevant curriculum materials prioritising adaptability based on a UDL approach for use in Further Education settings.
- Establish structures for the CEUD (and contractors) to host access to the prepared materials for use in webinars and for CPD in Further Education.

Introduction

This report presents the outcomes from a project commissioned by the National Disability Authority (NDA), Centre for Excellence in Universal Design (CEUD) to develop a Short Course on Universal Design for use in 2nd Level Junior Cycle in Ireland. The project contractor, H2 Learning has developed a Universal Design Short Course titled "Creating Designs for our Tomorrows".

The project was planned for two parts or phases of deliverables that included Phase 1 - Course Development, and a provisional Phase 2 - Course Rollout. This report covers the project outputs from the Phase 1 Course Development, along with recommended steps to follow for a Phase 2 – Course Rollout.

Creating Designs for our Tomorrows is designed to provide an opportunity for second level schools to incorporate Universal Design into their Junior Cycle programme. The Short Course explores the positive contributions a Universal Design approach can have in the community, by enriching student experiences with Products and Services, the Built Environment and Information and Communications Technologies (ICT). It is designed to be delivered in a practical, engaging manner through a combination of human data information, research and analysis tasks, user trials and project design briefs.

This project was developed in keeping with the remit of the CEUD, to advance the

promotion of Universal Design in education in Ireland. As under the Disability Act 2005, Universal Design refers to the design and composition of an environment so that it can be accessed, understood and used to the greatest extent possible by all people, regardless of their age size, ability or disability. The CEUD as part of the NDA promotes Universal Design in education, in standards and through awareness activities. Its key areas of focus are on the built environment, products and services, and Information and Communications Technology.

Creating Designs for our Tomorrows is aligned with the Framework for Junior Cycle and the guidelines and specifications for Junior Cycle Short Courses developed by the National Council for Curriculum and Assessment (NCCA) and the Junior Cycle for Teachers (JCT). The course development process was informed by input and feedback from stakeholders including teachers, students and academics involved in initial pilot testing of course content in the classroom, through conducting focus groups and from operating Teacher Workshops.

The planned initial piloting of this short course with teachers and schools was impacted by delays associated with Junior Cycle Reform, which curtailed teacher training, new course implementation and assessment procedures in schools. This challenge has provided opportunities to explore alternatives for incorporating *Creating Designs for our Tomorrows* resources into other second level and further education programmes. A range of other opportunities have been identified.

Teachers and schools have commenced to consider the introduction of short courses into their Junior Cycle for the 2017 – 2018 school year. This change provides an opportunity to re-engage with teachers and schools who have expressed interest in piloting and delivering a Universal Design short course. This Report outlines the background for the short course and the Junior Cycle context. It discusses the approach taken to developing *Creating Designs for our Tomorrows*. It outlines the stakeholder input and pilot testing carried out during Phase 1. It also covers the content and methodologies in the materials prepared as outputs for the project work in Phase 1. Appendices A – E contain information in support of this report, a Glossary of Terms, as well as samples of the curriculum materials developed.

Background and Approach

As background to the objectives and key drivers for this Universal Design short course project was feedback to the CEUD from 3rd level educators based on previous Universal Design education projects and opportunities at 2nd Level. Feedback from education workshops and outcomes from rollout of Universal Design at 3rd Level indicated that Universal Design is important and can complement numerous subjects; however, the basics of Universal Design should be introduced to students at an earlier stage in their education. Also informing the project planning was an opportunity to introduce new curriculum at 2nd Level following the introduction of short courses in the Junior Cycle. This feedback and the introduction of the new Junior Cycle Student Award (JCSA)[4] provided an opportunity to engage with a second-level school audience in relation to Universal Design.

CEUD had previously piloted Universal Design module at Transition Year at Second Level in Ireland[5] using an adapted version of the University of Cambridge module "Designing our Tomorrow". The CEUD module consisted of set of 12-lessons based on the UK Designing our Tomorrow Project.[6] The UK content was adapted into a Universal Design module titled *Designing our Tomorrows, Universal Design for Transition Year* (DOT-UD TY). It was piloted in two post-primary schools in Transition Year in Ireland, as a preparation for the Design & Communication Graphics (DCG) Leaving Certificate course. The module focused on teaching students how to consider and apply peoples' needs and preferences when designing for a wide range of abilities and characteristics across a diverse population. It prioritised problem-solving based methods and higher order thinking skills by facilitating students through authentic design projects.

The DOT-UD TY pilot project enabled the CEUD to obtain some proven design related curriculum materials that were adapted for teaching Universal Design in Ireland. The pilot concluded that the Transition Year format tends to be fragmented making it difficult to teach a structured Universal Design course. The pilot also highlighted the need for an integrated and progressive approach to teaching Universal Design, and design in general, across subjects and years. A subsequent review of the Cambridge project focussed on how best to localise the DOT-UD TY module for rollout in schools.

Based on the learning and recommendations from these projects and engagement with relevant stakeholders, the CEUD designed this project to focus on preparing a short course which could be incorporated by second-level schools into the new Junior Cycle offering. It was understood that a short course specification would be a first step to develop a short course in line with the Framework for Junior Cycle[7] published by the

[4] NCCA Introduction to Junior Cycle: http://www.curriculumonline.ie/Junior-cycle/Junior-Cycle-is-changing
[5] Transition Year: http://www.pdst.ie/TY
[6] University of Cambridge Designing our Tomorrow: https://www.education.Designingourtomorrow.com
[7] Framework for Junior Cycle: http://www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/Framework-

National Council for Curriculum and Assessment (NCCA). The advisors to the short course project identified that strong integration with Science, Technology, Engineering and Maths (STEM), particularly through the Technology, Art and practical subjects at second-level would provide opportunities for uptake and integration for students at Junior Cycle.

Junior Cycle Reform – Opportunity for Short Courses

Beginning on a phased basis in September 2014, the Department of Education and Skills set about reforming[8] the first three years of post-primary education by introducing the new Junior Cycle, to eventually replace the existing Junior Certificate. The new Junior Cycle provides an opportunity for second-level schools to incorporate new curriculum alongside the traditional subject based offering. The new mix of subjects and short courses focus on literacy, numeracy, key skills, and new approaches of assessment and reporting. New Junior Cycle subjects are being introduced on a year-by-year basis. English was the first Junior Cycle subject expected to be examined in 2017.

It is generally acknowledged that this change is required for the educational experience of students at lower second-level. As stated in The Framework for Junior Cycle (2013), "the current arrangements do not allow teachers to develop their students' skills and abilities in the way we would want but more importantly in a way that reflects the interests and needs of our students."[9] The new Junior Cycle allows schools to offer a high-quality programme, combining a mix of subjects and short courses that meets the needs of their students and fits the context, environment and community of the school. The Framework for Junior Cycle provides a basis to create the conditions where schools, in planning and organising their Junior Cycle programme, can focus on the learning taking place in classrooms. The Framework supports the development of learning experiences that help students connect to and engage positively with learning. Through its breadth and flexibility, it encourages innovation and supports creative learning in the classroom.

In moving away from a focus on final state examination, the new Junior Cycle re-positions assessment where research tells us it matters most, in the classroom.[10] It also facilitates schools in ensuring that, literacy, numeracy and key skills are embedded in the learning that is taking place.

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for-Junior-Cycle-2015-2.pdf

[8] Department of Education Junior Cycle Timeline: http://www.education.ie/en/Schools-Colleges/Information/Curriculum-and-Syllabus/Junior-Cycle-/A-Framework-for-Junior-Cycle1.html

[9] Information on the Framework for Junior Cycle: http://www.education.ie/en/Publications/Policy-Reports/A-Framework-for-the-Junior-Cycle-Information-on-the-Framework.pdf

[10] ESRI research into the experiences of students in the third year of junior cycle and in transition to senior cycle: http://www.ncca.ie/uploadedfiles/publications/ESRI_3rdYr.pdf

The Junior Cycle facilitates students to make a greater connection with learning by offering experiences that are engaging and enjoyable for them, and relevant to their lives. These experiences contribute directly to the physical, mental, social well-being of learners and where possible, provides opportunities for them to develop their abilities and talents in the areas of creativity, innovation and enterprise. "The learner's Junior Cycle programme builds on their learning to date and actively supports their progress in learning and in addition, supports them in developing the learning skills that will assist them in meeting the challenges of life beyond school."[11]

The Framework for Junior Cycle is underpinned by eight principles (Figure 2). These principles inform planning for the development and implementation of the Junior Cycle programme in schools. These principles are relevant to the Universal Design principles in that both sets of principles are based on similar goals whereas Universal Designs can help to enable and facilitate achievement of many of the Junior Cycle principles.

Quality All students experience a high-quality education, characterised by high expectations of learners and the pursuit of excellence.	**Wellbeing** The student experience contributes directly to their physical, mental, emotional and social wellbeing and resilience. Learning takes place in a climate focused on collective wellbeing of school, community and society.
Creativity and innovation Curriculum, assessment, teaching and learning provide opportunities for students to be creative and innovative.	**Choice and flexibility** The school's Junior Cycle programme is broad enough to offer a wide range of learning experiences to all, and adaptable enough to offer choice to meet the needs of students.
Engagement and participation The experience of curriculum, assessment, teaching and learning encourages participation, generates engagement and enthusiasm, and connects with life outside the school.	**Inclusive education** The educational experience is inclusive of all students and contributes to equality of opportunity, participation and outcomes for all.
Continuity and development Curriculum, assessment, teaching and learning enable students to build on their learning to date, recognise their progress in learning and support their future learning.	**Learning to learn** High quality curriculum, assessment, teaching and learning support students in developing greater independence in learning and in meeting the challenges of life beyond school, of further education, and of working life.

Figure 2: Principles for Junior Cycle Education[12]

Schools now have the flexibility to provide a blend of core subjects and short course options as part of their Junior Cycle offering. The overall Junior Cycle programme must

[11] A Guide to Writing Short Courses in Junior Cycle: http://www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/SHORT_COURSES_GUIDE_V7.pdf

[12] Framework for Junior Cycle: https://www.education.ie/en/Publications/Policy-Reports/Framework-for-Junior-Cycle-2015.pdf

address the 24 statements of learning, which are set out in Figure 3. The statements describe what students should know, understand, value and be able to do at the end of Junior Cycle. They should also acquire key skills through their learning. Each lesson overview in the course specifically identifies the learning intentions and associated, statements of learning and key skills.

The student:

1. communicates effectively using a variety of means in a of contexts in their first language
2. listens, speaks, reads and writes in their second language and one other language at a level of proficiency that is appropriate to her or his ability
3. creates, appreciates and critically interprets a wide range of texts
4. creates and presents artistic works and appreciates the process and skills involved
5. has an awareness of personal values and an understanding of the process of moral decision making
6. appreciates and respects how diverse values, beliefs and traditions have contributed to the communities and culture in which she/he lives
7. values what it means to be an active citizen, with rights and responsibilities in local and wider contexts
8. values local, national and international understands the importance of the relationship between past and current events and the forces that drive change
9. understands the origins and impacts of social, economic, and environmental aspects of the world around her/him
10. has the awareness, knowledge, skills, values and motivation to live sustainably
11. takes action to safeguard and promote wellbeing and that of others
12. is a confident and competent participant in physical activity and is motivated to be physically active
13. understands the importance of food and diet in making healthy lifestyle choices
14. makes informed financial decisions and develops good consumer skills
15. recognises the potential uses of mathematical knowledge, skills and understanding in all areas of learning
16. describes, illustrates, interprets, predicts and explains patterns and relationships
17. devises and evaluates strategies for investigating and solving problems using mathematical knowledge, reasoning and skills
18. observes and evaluates empirical events and processes and draws valid deductions and conclusions
19. values the role and contribution of science and technology to society, and their personal, social and global importance
20. uses appropriate technologies in meeting a design challenge
21. applies practical skills as she/he develop models and products using a variety of materials and technologies
22. takes initiative, is innovative and develops entrepreneurial skills
23. brings an idea from conception to realisation
24. uses technology and digital media tools to learn, communicate, work and think collaboratively and creatively in a responsible and ethical manner [13]

[13] NCCA Statements of Learning: http://ncca.ie/framework/doc/statement_of_learning.pdf

Figure 3: Junior Cycle Key Skills

The Framework for Junior Cycle outlines a set of 8 key skills[14] (as shown in figure 4 and outlined in Appendix B) that are needed to support learners in their personal, social and work lives. As learners develop each of the key skills in an integrated way they will also become better learners. The *Creating Designs for our Tomorrows* short course integrates and supports the development of these key skills:

- Being Literate;
- Managing Myself;
- Staying Well;
- Managing Information and Thinking;
- Being Numerate;
- Being Creative;
- Working with Others;
- Communicating.

Junior Cycle Short Courses

Throughout the Junior Cycle, a student can learn through a combination of subjects and short courses. Subjects require 200 hours of student engagement while short courses require 100 hours. Where an opportunity exists two 100-hour Short Courses can be used by a school in an open 200-hour time period to compliment other subjects.

Assessment is through classroom-based assignments and project work, which is reported upon to parents/guardians and students by the school. Schools are responsible for designing the Junior Cycle offering while ensuring that all the statements of learning and the key skills are addressed in the overall Junior Cycle programme offered to their

[14] NCCA Key Skills: https://www.curriculumonline.ie/getmedia/def48e3f-68f9-42e4-95de-f30086321fd0/JSEC_Key_Skills_of-JC_English).pdf

students.

It is not intended that short courses will replace existing subjects. Inclusion of short courses allows schools to broaden the range of learning experiences for students, address their interests and encompass areas of learning not covered by the combination of curricular subjects available in the school. Schools may opt to include short courses developed internally or by another organisation, in accordance with the short course template and guidelines set out by the NCCA.[15]

Methodology

The National Disability Authority's Centre for Excellence in Universal Design has a statutory remit to promote Universal Design in education in Ireland. It had identified a need to introduce Universal Design at 2nd Level and therefore established a project of address that need.

The objective of the project is to develop a Junior Cycle Short Course to introduce Universal Design in Ireland. The Phase 1 Course Development part of the project on was to prepare Universal Design curriculum for second level to support student learning. The project provided for a provisional option of a Phase 2 involving Short Course Rollout, further to considering the outcomes of Phase 1.

The project methodology followed in Phase 1 involved:

- Clarifying the background and objectives for the Short Course.
- Research alignment of Universal Design with Junior Cycle Reform.
- Establishing a Short Course Specification in-line with NCCA Guidelines.
- Working through best practice curriculum development activities.
- Pilot testing and engaging with stakeholders for feedback through revisions.
- Preparing complete curriculum materials for use in education structures.
- Providing guidelines for use of the curriculum by teachers and schools.
- Exploring other opportunities for alignment and use of the curriculum.
- Preparing a project report with recommendations for next steps.

[15] A Guide to Writing Short Courses in Junior Cycle:
http://www.juniorcycle.ie/NCCA_JuniorCycle/media/NCCA/Documents/SHORT_COURSES_GUIDE_V7.pdf

Development of the Universal Design Short Course

It was understood that Second Level curriculum about Universal Design would have to align with the remit of the CEUD and introduce students to the potential they have to benefit society through participation in design decisions that can work for all people. The short course would be to introduce Universal Design as a subject through awareness and practical experiences at second level to encourage students to pursue further related study in their later educational and apply Universal Design in their occupations and life experiences.

To align with the remit of the CEUD and offer the short course the optimal chance for rollout, *Creating Designs for our Tomorrows,* which is the outcome of Phase 1 of CEUD's project for Second Level, was developed in line with the NCCA guidelines for Junior Cycle short courses.[16] In doing so, the course content was designed with 13 to16-year-old students in mind and focuses on the development of the Junior Cycle key skills and statements of learning. It explores the positive contributions a Universal Design approach can have in our communities, by enriching peoples' experiences with Products and Services, the Built Environment and ICT.

Universal Design Short Course Specification

Through consultation with stakeholders and project team meetings, the short course outline was developed into an initial course specification to help clarify the course rationale and to frame the intended content for the course. Following approval of the initial short course specification (see Appendix A) by the NDA, work proceeded to align the development of the short course with the NCCA Junior Cycle Framework and Guidelines. The short course specification sets out the overall focus of the short course under the headings:

- Title;
- Rational;
- Aims and Values;
- Statements of Learning;
- Literacy and Numeracy;
- Key Skills;
- Course Overview;
- Assessment and Certification;
- Expectations for Learners;
- Resources.

[16] NCCA Junior Cycle Guidelines: http://www.ncca.ie/en/Curriculum_and_Assessment/Post-Primary_Education/Junior_Cycle

The short course is designed to be delivered in a practical engaging manner through a combination of human factors research and analysis tasks, user trials and project design briefs. Student's responses and practical outcomes will vary depending on the teacher delivering the course and how the course materials are used.

Students essentially learn how to look at a design from a user perspective, ask the relevant explorative questions, analysing the user needs and the needs of the wider community, present a valid Universal Design solution, make prototype designs and evaluate the usability of their final designs. They develop an idea to address a human need, from concept through to basic manufacture and realisation. With a strong focus on observation, social identity and primary research, students are supported in developing their verbal skills and confidence. Students create projects, which appreciate the role of design, technology, manufacturing and our social responsibility in meeting the needs of a diverse population.

The learning outcomes for the short course align with the Aims and Values for the Short course listed in the Course specification at Appendix A, and are derived in summary to achieve many of the Junior Cycle statements of learning in shown in Figure 3 and the key skills listed at Appendix B. The key learning outcomes for this short course are that students:

- Recognise that they are part of a bigger community and that they have responsibilities in contributing to this global community.
- Learn how to employ design thinking strategies in approaching everyday problems and in improving experiences for all.
- Become an active citizen through supporting better designs for inclusive and sustainable environments that benefit all citizens.
- Actively engage with materials and processes in their environment to communicate their ideas in a practical manner.
- Through design projects they create practical links in their understanding of STEM knowledge and experiences.

Embedding Key Skills into the Short Course

Creating Designs for our Tomorrows is a short course which specifically addresses the key skill elements (as outlined in Appendix B). Throughout the short course, students acquire and enhance their proficiency in these key skills. The key skills are embedded into the learning experiences encountered by students and are evident in the assessment approaches used in the classroom. This is a fundamental shift in focus from the acquisition of information

and content, to the development of skills necessary to design for living, working and learning in today's world.

By embedding the key skills in this way, learners are presented with a range of learning experiences and outcomes that help to improve their present and future access to learning, their social interaction, their information and communication abilities and their ability to work collaboratively.

Embedding Learning Design

The main learning approach in *Creating Designs for our Tomorrows* is investigative, active and promoting higher order thinking. The activities based on designing and making, helps to teach a student to organise, decipher and communicate their thoughts. The strong focus on observation, social identity and primary research tasks helps students to develop their verbal skills and confidence. Students create projects that help to promote an appreciation for the role of design, technology, manufacturing and our social responsibility in meeting the needs of a diverse population.

Embedding Teaching Methodologies

Creating Designs for our Tomorrows is structured as an adaptable modular short course, which supports teachers in delivering the process of Universal Design, regardless of their subject area, design experience and design competency. The course offers flexibility in content and experiences that appeals to teachers within the Technology, Art; Maths and Science subject realms. The range of embedded instructional strategies encourages teachers to consciously modify their instructional actions to maximise student learning.

Teachers are encouraged to utilize the creative thinking and analytical methodologies pioneered by Dr Edward de Bono[17] embedded in the short course that are employed to promote critical thinking in students. These include:

- CoRT Thinking
- SWOT analysis (Strengths, Weakness, Opportunities and Threats),
- CAF (Consider All Factors),
- PMI (Positive, Minus, Interesting).

Creating Designs for our Tomorrows also integrates many of the classroom strategies highlighted by the Junior Cycle Support Service such as Think-Pair-Share, Blue Sky Thinking, PlaceMats and Mindmapping.[18] In each strand, a selection of tasks is provided so that teachers have the flexibility to choose a design brief that best represents the interests and

[17] De Bono Creative Thinking Techniques: http://www.edwarddebonofoundation.com/Creative-Thinking-Techniques/CoRT-Tools.html

[18] JCT Classroom Strategies: http://www.jct.ie/wholeschool/classroom_strategies

experiences of their student body. This ensures the course is organic and localised to the needs of individual communities and demographics. Students can see the relevance of their learning and appreciate the positive impact Universal Design can have in their local environment.

Use of project briefs and lesson tasks guide teachers and students through the stages of the Double Diamond design process model. The Double Diamond process maps to the divergent and convergent stages of a design process. Created by The British Design Council[19], the process describes modes of thinking that designers use. It guides students through stages of thinking and stage-gate design decisions to bring an idea from concept to realization.

It leads the user through convergent and divergent thought processes in working through a design brief. It is an iterative process recognised as best practice, which is fundamental to good Universal Design practice. Each topic in the course reiterates the Double Diamond and systematically expands on this approach to support teachers in confidently adopting it in their classroom.

The Education Training Boards Ireland (ETBI) Professional Development Instructional Leadership Programme,[20] facilitated by Professor Barrie Bennett, author of Graphic Intelligence[21] also informed the short course methodology and teaching approaches.

A member of the H2 project team who has a role as the Technology Subject representative for the TUI was able to inform the short course on STEM topic contents. Their membership with the NCCA curriculum development group for the new Junior Cycle Technology programme also helped to inform this project about how to develop the short course on Universal Design to best align with opportunities at the Junior Cycle. They had also completed a professional development course in Universal Design for Learning (UDL) through the ICEP (Institute of Child Education and Psychology). This knowledge helped to frame the adaptable and modular short course structure that provides teachers with opportunities for offering and supporting the three key principles of UDL that facilitate multiple means of representation, expression and engagement.

Embedding Assessment

The most significant change in the new Junior Cycle is in the area of assessment. Some of the latest approaches to assessment are embedded into the *Creating Designs for our Tomorrows* short course where teachers and students can engage in on-going assessment activities as part of classroom practice. Classroom-based assessment is carried out through each of the course strands. Most of the assessment activities are formative in nature and are designed to inform the teacher on how the students are progressing and inform any

[19] British Design Council: http://www.designcouncil.org.uk/
[20] Instructional Leadership: http://www.instructionalleadership.ie
[21] Graphic Intelligence (Chapter 1): https://assets.pearsonschool.com/asset_mgr/current/201048/gi_chapter1.pdf

adaptions necessary. This can also be used to report on progress to parents/guardians and students by the school. The teacher guidelines and resources provide assessment components where students present evidence of learning on an on-going basis, including the final project in Strand 4. These assessment components (Table 1) form the basis of recording achievement for the Junior Cycle Profile of Achievement (JCPA).

Assessment/ Weighting	
An introduction to Universal Design Emphasis on Products and Services	20%
The role of technology in Universal Design Emphasis on the Built Environment	25%
Disability – Equality and Inclusion through Universal Design Emphasis on ICT and UDL	15%
Final Universal Design Project Design Portfolio – 20% Artefact – 20%	40%

Table 1: Assessment Components and Weighting

Embedding STEM Education

The STEM Education in the Irish School System Report[22], published by the Department of Education and Skills in 2016 recommended a renewed focus on STEM (science, technology, engineering and mathematics). This involves the STEM skills (e.g. problem-solving, modelling, design, IT skills) and ways of learning (e.g. inquiry, evidence-based reasoning and logical thinking) being central to the development and delivery of new curricula from Early Childhood to Leaving Certificate. *Creating Designs for our Tomorrows* meets this requirement as it is focussed on ensuring that students have the skills to present real-world design solutions while highlighting the relationship between Design, Technology and People.

Relevant elements of the STEM disciplines are integrated into the Universal Design short course strands of *Creating Designs for our Tomorrows*. Students will explore the basics of Electronics and Control, Materials Technology, Orthographic drawing and Mechanics model making. This technical knowledge is delivered in conjunction with the Principles and Guidelines of Universal Design along with key national and international societal trends such as, accessibility needs across populations, ageing demographics and human factor data.

By its nature, the Universal Design process is a logical and tiered approach to learning. It requires students to become more autonomous while equally developing their sense of social identity and social responsibility. Therefore, the course can appeal to all students but in particular to students who are inquisitive and creative by nature. They come to see

[22] STEM Education in the Irish School System Report: https://www.education.ie/en/Publications/Education-Reports/STEM-Education-in-the-Irish-School-System.pdf

themselves as designers, problem solvers and future innovators with confidence to make an impact in society.

Consideration for Adaptability of the Use of the Content

The *Creating Designs for our Tomorrows* short course is designed to be adapted to meet the needs of students. Teachers can:

- adapt the lessons to meet the different learning needs in the classroom;
- create bespoke quizzes to assess students' learning progress through the course;
- together with students, develop their own projects to support assessment for learning or projects with elements of assessment for accreditation as outlined in the course specification.

The *Creating Designs for our Tomorrows* short course is structured as a set of four strands that can be taught in a number of ways:

- the four strands can be taught as a Junior Cycle short course on Universal Design;
- one or more of the strands can be taught as stand-alone modules;
- or, aspects of the course can be taught to support other Junior Cycle, leaving certificate and further education courses which have curriculum requirements such as; design thinking, creativity, accessibility in Architecture, ICT and STEM subjects.

The course content and materials as developed in Phase 1 are brand neutral, so as to allow for maximum adaptability to repurpose the content for other courses, setting and audiences. All course materials have been developed according to best practice accessibility guidelines to enable and optimise use of the embedded Universal Design for Learning[23] features.

Stakeholder Engagement in the Development of the Short Course

Key stakeholders have participated in the development of *Creating Designs for our Tomorrows* through awareness workshops hosted by CEUD, the City of Dublin Education and Training Board (CDETB) Curriculum Development Unit (CDU) and at the Universal Design in Education Conference. Representatives of the following groups have engaged with the development of *Creating Designs for our Tomorrows* as stakeholder advisors:

- Art Teachers' Association of Ireland (ATAI);
- Technology Teachers Association;
- Irish Computer Society (ICS);

[23] CAST Universal Design for Learning: http://www.cast.org/our-work/about-udl.html#.WuNF3lWnHGg

- Irish Architectural Foundation;
- Computer Education Society of Ireland (CESI).

In addition, the following organisations have been briefed on *Creating Designs for our Tomorrows* and have provided input into the course development process:

- Junior Cycle for Teachers Support Service (JCT);
- National Council for Curriculum and Assessment (NCCA);
- City of Dublin Education and Training board CDETB Curriculum Development Unit;
- Further Education Support Service;
- Association of Community and Comprehensive Schools (ACCS);
- Association of Teacher Education Centres Ireland (ATECI).

Universal Design Short Course Content

The short course developed in this project was informed by research, learning, stakeholders and the Framework for Junior Cycle. It is currently titled *Creating Designs for our Tomorrows* and consists of a total 100 to 110 hours of contact and project work time, in line with the Junior Cycle short course allocation of 100 hours. The 86 lessons are grouped into a 4-strand structure:

Strand 1: An introduction to Universal Design

Strand 1 consists of 28 Lessons. It introduces the Universal Design Principles with emphasis on the Universal Design (UD) of Products and Services. Students conduct user needs analysis and understand the role of primary and secondary research in establishing user needs and specifications in the course project assignments.

Strand 2: The role of technology in Universal Design

Strand 2 consists of 22 Lessons. In this strand, students explore UD and Social Diversity particularly for our growing ageing population. This Strand is focused on UD within the Built Environment. Students explore the use of sensors, electronic control devices and smart materials. Students begin to communicate design thinking through a range of prototype creation tasks.

Strand 3: Disability – Equality and Inclusion through Universal Design

Strand 3 consists of 20 Lessons. In this strand, students explore the challenges met by those with physical, sensory, mental health or intellectual disability in accessing services and living an independent life. Students are also introduced to Universal Design for Learning and complete tasks, which require technological modification to ensure products and services,

are more universally accessible.

Strand 4: Final Project

Strand 4 consists of 16 Lessons. Students are presented with a range of flexible design briefs, which they can adapt to their local environment and community. They work towards the development of a final ICT product or system design project, which encapsulates their learning across the three strands and demonstrates their competency with design activities.

The full course outline is detailed in Appendix C.

Teacher Guidelines and Resources

Creating Designs for our Tomorrows is prepared as a ready-made, off-the-shelf course. The teacher guidelines, lesson plans, project ideas and the course specification can support teachers to build the students' capacity and skills to engage in self-directed learning, support assessment for learning and provide ideas for assessment for accreditation.

The teacher and student course materials are available in electronic format and are designed so that they can be delivered in an adaptable way to various audiences. The content includes lesson outlines, teaching and learning resources, and topic support PowerPoints for use by teachers. All of the teaching and learning resources are prepared to be downloaded individually and are designed in such a way that they can be repurposed easily so that they can be delivered via a Learning Management System (e.g. Moodle) or can be adapted for other course delivery options. This adaptability allows individuals or organisations to use parts, or the entire short course.

All lessons are supported with a lesson instruction resource for teachers, together with a supporting PowerPoint and student worksheets where applicable. Within each lesson, teachers are guided through a range of cooperative learning strategies and opportunities for Assessment for Learning[24]. Each lesson details how the content or the activity aligns with key skills and statements of learning.

To develop independent learning skills and student autonomy, students are encouraged to review their prior learning, set individual objectives as well as, both peer review and self-assess their progress. Within each lesson, teachers have the flexibility to extend lesson topics to help differentiate the content to support all learners. Suggestions are provided to support this modular approach within the classroom. At the end of each lesson, topics for further research and discussion are provided. These further encourage student engagement and support a variety of group dynamics.

[24] NCCA Assessment of Learning: http://www.ncca.ie/en/Curriculum_and_Assessment/Post-Primary_Education/Junior_Cycle/Assessment_for_Learning_AfL_/Key_principles/AfL_-_Key_principles.html

Summary of Phase 1 Project Outputs

The outputs from the Phase 1 Short Course development include:

- The new *Creating Designs for our Tomorrows* Junior Cycle short course was developed with a complete Teacher Resource Pack to support student learning and ease of use by students and teachers.
- The existing CEUD resources including the Transition Year module and some 3rd level content have been integrated into the new short course.
- The 100 hours of lessons have been developed in a modular fashion allowing for adaptability to use aspects of the course for delivery in taster modules.
- *Creating Designs for our Tomorrows* focuses on the three main Universal Design areas: built environment; products and services; and Information and Communications Technology.
- The project benefited from successful partnership with advisors and stakeholders that informed the short course development so that it reflects best practice in Universal Design, it is student centred in its approach, and is in line with the new Junior Cycle and relevant education policy.
- The course materials are developed in web format and can be easily integrated into school course management and virtual learning environments.
- The Teacher Resource Pack includes assessment tasks focussed on project-based work.
- The Teacher Resource Pack includes the entire course content, assessment structures, suggested teaching and assessment methods, teaching materials and student worksheets.
- The Teacher Resource Pack provides guidelines for teachers and schools on planning and implementing the short course and opportunities to follow through to Transition Year and/or Leaving Cert.

Pilot Testing of the Universal Design Short Course

The following outlines how the short course was pilot tested and refined as part of the course development. The Short Course materials have been pilot tested in a variety of ways. The project has gathered feedback on the course content and methods through a number of sources over the past year from teachers, students and stakeholders to support analysis and revision of the Short Course. Parts of the Short Course content has been used as parts of other design initiatives, in the classroom, at conference presentations and workshops. The feedback has been very positive and there is a significant interest in seeing Universal Design incorporated into school curricula.

Pilot Testing in the Classroom

In collaboration with teachers in 2nd level Community College, the Lead Developer was in a position to pilot lesson resources to students in Technology, Metalwork, Woodwork and Art classes.

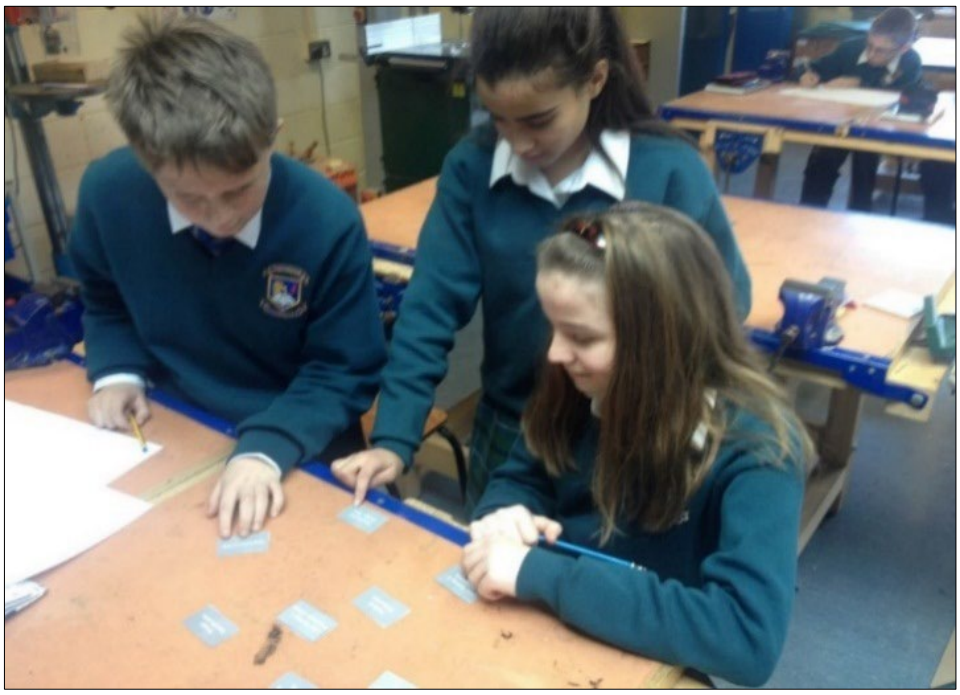


Figure 4: Student problem solving in Castleknock Community College

In experimenting with the content, the Lead Developer used strategies from a course she completed in Instructional Leadership (2015-17). The image in Figure 4 shows students applying their understanding of the key stages in the Universal Design process. The strategy, Concept Attainment[25], requires students to figure out the key attributes of a data set which is part of Strand 2. This encourages collaborative group work and

[25] ACSD Planning for Concept Attainment: http://www.ascd.org/ascd-express/vol4/420-silver.aspx

promotes analysis and critical thinking.

The image in Figure 5 shows students involved in a CAF exercise (Consider All Factors - Edward de Bono). Students are at the Discover stage of the Double Diamond model in their project. Students write a brief overview of their idea in the centre of the page. The activity prompts exploratory questions around the outside of the page, which encourages their peer group to read their own overview and suggest developments and design opportunities. Another exercise suggested at many stages through the course is a Strength, Weaknesses, Opportunities, Threats (SWOT) analysis task, which this group also employed at the Define stage of their project.

Figure 5: Teacher Student Engagement with UD Process

This feedback has continually influenced the course progression and direction. Students reported that they liked the "hands-on" activities as shown in the image in Figure 6 and that these activities helped them to consider the needs of others in a way that they would not have done before. Students and teachers liked the way that the lessons related to other subjects that they were studying e.g. Art, Technical Drawing, Home Economics, Design Communications Graphics. Teachers liked the project focus and suggested the project ideas could be applied at Transition Year.

Some teacher comments related to lesson instructions, which were deemed 'text heavy' in places, and as such the material was edited. The six teachers involved adopted the Double Diamond design process model and found it extremely helpful in delivering

iterative designs and analysis tasks.

Figure 6: Design and Make UD activity

Assessment for Learning

Assessment for Learning is encouraged throughout the course by embedding the principles of formative assessment such as, sharing learning goals with students, involving students in assessing their own learning and by providing expert feedback. Four of the teachers had not previously used formative assessment in a structured way and this was their first introduction to formative assessment methodologies. The move away from the instruction led approaches which is core to the Junior Certificate exam-based system, on to the use of continuous and formative assessment will require teacher supports in the general rollout of the Junior Cycle reform. *Creating Designs for our Tomorrows* and the associated teacher guidelines provides practical examples of how this can be achieved.

Universal Design Awards

Linking the content in the short course to Universal Design events and associated activities on the promotion of design in Ireland provided both relevant case studies and connection to further information for students. As an example, the annual CEUD Universal Design Grand Challenge (UDGC) Student Awards, the CEUD 24 Hour Universal Design Challenges (2009 – 2011) and the 2015 Universal Design Hackathon[26] are referred to throughout the course as a resource for the promotion of Universal Design. The types of resources have been tested to inform the direction of some

[26] Grand Challenge Student Awards: http://universaldesign.ie/Awards/Student-Awards/

student's projects and some of the case studies used in the short course.

ID2015 Hidden Heroes

In early 2015, a series of learning resources and interactive workshops were developed for primary school children and used at the Irish Year of Design (ID2015) Hidden Heroes, The Genius of Everyday Things Exhibition[27]. The resource entitled Young Designers Toolkit introduces children to design thinking through the analysis of everyday simple objects. Adapted material from the UD short course featured in the learning resource and provided an opportunity to pilot the teaching material and methodology. While the material was developed for a primary school audience to develop their understanding of the impact of design on our daily lives, the content fed into the UD short course. Strand 1, Topic 1 (What is Design and how does Design impact me and my community?) was developed to inspire curiosity about design, encouraging students to think about design. Several of the product examples used in the 'Young Designers Toolkit' resource were transferred into the introductory design tasks on this topic.

To complement the Hidden Heroes exhibition, our Lead Developer ran two family Design workshops for ID2015 in Dublin Castle. The first workshop was an introduction to Design and Electronics that utilised materials from the STEM section of the short course (Strand 2, Topic 3 An introduction to Electronic and Control systems). While the content was adapted, it was an opportunity to pilot the teaching approaches and differentiate the resources. The second workshop, an adult skill share session looked at using electronics and control systems to create more accessible public services and more inclusive public designs. The support material for this session linked to the UD Principles and Guidelines worksheets and the STEM course material developed. Both sessions were well received with positive feedback from participants.

NDA Universal Design in Education Conference

Testing the introduction of the short course to a group of educators was conducted by presenting in a workshop at the CEUD Education Conference[28] in November 2015. A workshop titled "Bringing Universal Design to School" workshop was developed and delivered by H2. An overview of the short course was presented and set in the context of the Junior Cycle Student Award (JCSA) key skills and competency requirements.

Workshop participants worked through two lesson activities from the course. There was a product analysis lesson and an iterative prototype model making task. Participants were engaged in a discussion about the student's journey through the course and skill

[27] Hidden Heroes: http://www.irishdesign2015.ie/programme/single/hidden-heroes
[28] Universal Design in Education Conference: http://education.universaldesign.ie/

progression. Feedback was collected to inform refinement of the short course.

Universal Design at Tech Week

A display stand entitled "Connect2UD" was developed and operated at Tech Week Showcase day in April 2016[29] to introduce students and teachers to the Universal Design Short Course. Tech Week is operated by the Irish Computer Society (ICS). ICS has been an active advisor in the development of the Short Course.

The stand provided information and activities for students about the different ways people see, hear, think, move and use everyday things. Also, teachers were introduced to the *Creating Designs for our Tomorrows* short course and how it focuses on human diversity and user centred design methods blended with maker skills and STEM topics.

The stand hosted multiple posters, a CEUD video titled "Meet the Normals"[30] that was developed as part of the third level curriculum to explain the Universal Design process. Also, it hosted interactive Universal Design learning games to attract student interest. Hundreds of students viewed the stand. Interested teachers received a brochure about the short course and their names were recorded for follow up.

A brochure shown in the image in Figure 7 was developed for use at the Tech Week Showcase day. Images of the posters used on the "Connect2UD" stand and a Twitter post to the Tech Week participants is shown in Figure 8.

[29] TechWeek: https://www.techweek.ie/news/2016/04/
[30] Meet the Normals Video: https://www.youtube.com/watch?v=tgSRm9opn9E

Figure 7: Brochure used at Connect2UD TechWeek Stand

Figure 8: Tweet from Connect2UD stand at TechWeek

Introducing Universal Design in Teacher Development

The development of professional standards has been initiated through the Cosán Framework for Teachers' Learning[31], as the new national framework for teachers' learning. The Cosán development phase was to begin in advance of national implementation in 2020. With the onset of Cosán, teachers will need to build their CPD record and will need to be proactive in sourcing CPD opportunities. Cosán can be a vehicle for promoting the Universal Design message to teachers.

In autumn 2016, work began to tailor the Universal Design resources to raise awareness around Universal Design in education for use in a series of workshops for teachers, further education tutors, teacher support services and other stakeholders. A Universal Design Short Course Awareness Workshop was developed and piloted.

UD Short Course Awareness Workshop

H2 organised a half-day workshop working closely with the City of Dublin Education and Training Board CDETB Curriculum Development Unit. The objective that the workshop was to increase awareness of Universal Design at various education levels (initially second and further education levels). In preparation for the UD Awareness workshop, planning was done to prepare a sample of the teacher resources into an Initial Teacher Pack. This comprised of a set of digital resources that participating teachers could download.

Schools and colleges attending workshops were provided access to a trial Universal Design in education website with teaching resources, webinars and a community of practice for teachers. The website and a sample of the teacher and learner materials provided for workshop preparation and follow-up. It allowed for testing, updating and repurposing resources so as to make them available to various audiences as further workshops are established.

Piloting of the UD Awareness Workshop - Feedback

A pilot test of the Universal Design Awareness Workshop was run by H2 with the support of the Curriculum Development Unit (CDU) and the Further Education Support Service (FESS) on 21st October 2016 at the City of Dublin ETB Psychological Service facility. A sample of some of the resources selected from the short course materials for use in the workshop are displayed in Appendix D.

The objectives for the pilot UD Awareness Workshop were to:

[31] Cosán Framework: http://www.teachingcouncil.ie/en/Publications/Teacher-Education/Cosan-Framework-for-Teachers-Learning.pdf

- Pilot the UD Awareness Workshop content and deliver to a teacher group;
- Develop an on-going engagement with a teacher cohort;
- Identify potential teacher UD champions;
- Identify potential teacher trainers and facilitators;
- Harvest new resources and ideas for delivery through on-going discussion and engagement.

Deputy Principals and senior management from 12 second and further education level schools attended who had an interest in creativity, design, innovation and accessibility.

Some of the key learnings from the pilot workshop included:

- There are a number of opportunities for Universal Design to be incorporated in the programmes and course at Further Education level. The materials and approaches developed for the Junior Cycle are appropriate to an adult learner audience. This would also involve the inclusion of some of the Third Level curriculum materials.
- Principals and middle management would welcome more information and support with regard to incorporating Universal Design and Universal Design for Learning into overall school/college planning.
- Schools/colleges need assistance with planning for and implementing Universal Design Principles across the school to make all aspects of the educational experience more inclusive for students, parents, and staff.
- Schools/colleges are looking for Universal Design information and support to improve communications with parents, accessibility of school/college websites and student services.
- The Principles of Universal Design poster could be updated and made more appropriate for schools/colleges.

Conclusions from Pilot Testing

The development of the short course has been informed through stakeholder engagement and teacher feedback.

Classroom pilot testing has informed content and assessment methodologies. Feedback from teachers and students has been positive.

Activities in schools related to short courses have been delayed, but indicators show that schools are now beginning to reengage with Junior Cycle reform that would allow for piloting of this short course in schools as planned.

Discussion of Challenges and Opportunities for Rollout

Challenges to pilot testing and trials of the Short course in the Junior Cycle occurred during the project. Through stakeholder engagement and some testing activities there are positive results and renewed opportunities in the Junior Cycle.

Other opportunities have also been explored for how the course content, lessons and activities can be incorporated into teacher awareness programmes and into modules that can be integrated with other areas of second and further education.

Lessons Learned from Pilot Testing the UD Short Course

Overall, the short course materials, structure and activities have been well received by teachers and students. There has been limited opportunity for teachers and student to explore Universal Design or design/creativity in general within the confines of the Junior and Leaving Certificates. A challenge will be to help teachers:

- understand the importance of Universal Design;
- be confident to address UD with learners through practical, hands on lesson activities; and
- to be comfortable to incorporate UD into current and future lesson planning.

Delays in the Rollout of the Junior Cycle

The rollout of short courses into schools has been hampered by the delayed introduction of Junior Cycle Reform in post-primary schools.

This therefore presented challenges for this Universal Design project, as teacher training, new course implementation and assessment were severely curtailed. The rollout of short courses was put on hold by schools. At the time of writing this report, there were some examples of initial short course specifications developed by the NCCA and other organisations, although these were not being implemented by schools until there was union agreement and clarity around Junior Cycle reform implementation.

The Junior Cycle for Teachers (JCT)[32] support service has been established to support schools in their implementation of the Junior Cycle through the provision of appropriate high quality continuing professional development for school leaders and teachers, and the provision of effective teaching and learning resources.

[32] Junior Cycle for Teachers: http://www.jct.ie

Since September 2017, teachers have begun to re-engage with the Junior Cycle reform process.[33] This is likely to result in schools planning to pilot Junior Cycle short courses as part of their 2018-19 timetable.

Opportunity for the Junior Cycle Short Course with JCT

At the time of writing this report the Junior Cycle for Teachers Support Service (JCT)[34], indicates that it is establishing a Junior Cycle short course support team, which will promote the use of short courses by schools and will visit schools and advise on the set up of short courses by schools. *Creating Designs for our Tomorrows* is a complete short course that is ready to go which creates an opportunity for it to be considered by the JCT as an example by their team.

Linking with STEM

With the publication of the STEM Education Policy Statement 2017 - 2026, there is a renewed focus on Science, Technology, Engineering and Maths in the same way that Literacy and Numeracy have been for the past 6 years. Universal Design appears as listed under Outcomes for Pillar 3, Support STEM education practice, at bullet six, "Partnerships in place with Arts education promoting creativity, universal design and design thinking skills into all STEM learning experiences".[35] This provides an opportunity for CEUD to explore partnership with the Department of Education and Skills to promote creativity, Universal Design and design thinking skills.

Creating Designs for our Tomorrows has a very strong focus on Science, Technology, Engineering and Maths throughout all the strands. The short course objectives are in line with the development of STEM education principles and the development of STEM competencies for students at post primary as envisaged in the STEM Education Policy Statement. The authors recommend that the CEUD should consider adding a tagline to the course title which emphasises creativity, design thinking skills and linkage to STEM. This will help make the course more attractive to prospective school principals and teachers who may be looking to strengthen their STEM related offering.

[33] ASTI Junior Cycle Announcement: http://www.asti.ie/news/latest-news/news-article/article/information-notice-for-asti-members
[34] JCT Short Courses: http://www.jct.ie/shortcourses/shortcourses.php
[35] STEM Education Policy Statement 2017-2026: https://www.education.ie/en/The-Education-System/STEM-Education-Policy/stem-education-policy-statement-2017-2026-.pdf

Opportunities to Adapt the Short Course for Other Settings

Creating Designs for our Tomorrows is designed as an adaptable, modular model. At all development stages, Universal Design for Learning principles were incorporated. This means that while the course has been initially designed for the Junior Cycle, the course content, resources and activities can be adapted for a wide range of learners, age groups and audiences.

There is significant depth of topic content and complexity of the project briefs in the Universal Design short course focussed to be used over a 3-year teaching period. The short course offers flexibility in content and experiences to appeal to teachers within the Technology and Art subject realm and beyond. The structure provides the opportunity to adapt this core body of content to a range of different teaching scenarios outside the Junior Cycle.

Therefore, it was decided to explore opportunities to utilize the course resources in other education contexts. Interest has been shown in adapting the course content to deliver Universal Design modules for the following areas:

- Primary - Classroom Universal Design activities for Social, Environmental and Scientific Education (SESE).[36]
- First Year Second Level - Taster Module for students to sample the short course
- Transition Year Second Level - Universal Design Module
- Further Education - Universal Design for Learning Practitioner Awareness
- Further Education – A QQI Accredited Module which could be incorporated into communications, design and technology related further education and adult learning courses.

Based on our consultation with CEUD and the key stakeholders who have expressed interest in supporting the development of these opportunities, the following conclusions are offered to help clarify how best to prioritize the most likely opportunities and the timeframe involved in the next Phase.

[36] Social, Environmental and Scientific Education: http://www.pdst.ie/SESE

Conclusions

The resolution of the Industrial Relations dispute has reopened the opportunity to promote and integrate Creating for our Tomorrows into the new Junior Cycle offering at post-primary level.

A partnership with the Junior Cycle for Teachers Support Service would provide a strong basis to promote *Creating Designs for our Tomorrows* as a short course option for post-primary schools.

There is growing awareness of Universal Design and requirements for UDL training for teachers at primary, post-primary and further education and training levels.

Elements of the short course content can be adapted for use in First Year to provide a Taster Module to allow students to sample the short course and at Transition Year to introduce Universal Design.

Engagement with Further Education and Training Principals and Senior Management has highlighted opportunities for Universal Design to be incorporated in the programmes and courses in this sector.

Recommended Next Steps for Short Course Rollout

Based on the work in Phase 1 of this project and a current readiness to integrate Short Courses in the Junior Cycle we believe that the timing is optimal for initiating the Phase 2 rollout at second level. To plan a Phase 2 rollout to second level schools we recommend that the next action steps during the 2018/19 school year should include:

- Establish a partnership with the Junior Cycle for Teachers (JCT) Support Service.
- Establish a group of master trainers who will be in a position to conduct CPD workshops at teacher education centres along with online tutorials for teachers.
- Conduct CPD workshops to develop awareness of Universal Design at post-primary level using sample lessons from the course.
- Establish a community of champions based on teachers who express interest in running the short course in their own schools
- Optimise the short course materials for online delivery for teachers using the course in their schools.
- Host a series of periodic webinars to develop and sustain the community of practice and prepare for continued expansion of rollout.
- Identify at least 12 schools to begin piloting elements of the short course in preparation for rollout in the 2018/19 school year.

- Collect testimonials from principals, teachers and students, which can be used to promote the short course to other schools.
- Develop a promotional flier for use on social media and a webpage to promote the course to prospective teachers.
- Formalise on-going administration and maintenance of the short course including the provision of on-going feedback from users so as to maintain a high-quality service to schools.

Phase 1 stakeholder feedback has identified relevant uses of the course content in Further Education and with evolving Universal Design for Learning (UDL) initiatives. To optimise the uptake of the Phase 1 Short Course materials, it is recommended that work is done in Phase 2 on exploiting opportunities to adapt the short course materials to develop and deliver Further Education modules to promote Universal Design in relevant fields of study. For optimal efficiencies and impact, the following action steps should be operated in parallel with the above action steps for Junior Cycle, to include:

- Engage with Education and Training Boards, which have responsibility for Further Education provision.
- Prepare (train) the master trainers to be in a position to provide CPD and support to potential Further Education practitioners.
- Provide workshops for principals and senior managers in Further Education colleges.
- Package the relevant curriculum materials prioritising adaptability based on a UDL approach for use in Further Education settings.
- Establish structures for the CEUD to host access to the prepared materials for use in webinars and CPD for Further Education.

Appendix A – Universal Design Short Course Specification

Short Course Title: Creating Designs for our Tomorrows

Introduction to Junior Cycle

Junior Cycle education places students at the centre of the educational experience, enabling them to actively participate in their communities and in society and to be resourceful and confident learners in all aspects and stages of their lives. Junior Cycle is inclusive of all students and contributes to equality of opportunity, participation and outcome for all.

The Junior Cycle allows students to make a greater connection with learning by focusing on the quality of learning that takes place and by offering experiences that are engaging and enjoyable for them, and relevant to their lives. These experiences are of a high quality, contribute directly to the physical, mental and social wellbeing of learners, and where possible, provide opportunities for them to develop their abilities and talents in the areas of creativity, innovation and enterprise. The learner's Junior Cycle programme builds on their learning to date and actively supports their progress in learning and in addition, supports them in developing the learning skills that will assist them in meeting the challenges of life beyond school.

Rationale

'Universal Design is the design and composition of an environment so that it may be accessed, understood and used to the greatest extent possible without the need for adaptation by any persons of age or size or having any particular physical, sensory, mental health or intellectual ability or disability'. Ref National Disability Authority – Centre for Excellence in Universal Design

The "UD short course" is a practical, active and organic short course. It explores the positive contributions a Universal Design approach can have in our communities, by enriching our experiences with Products and Services, The Built Environment and ICT. It is delivered in a practical engaging manner through a combination of data studies, research and analysis tasks, user trials and project design briefs.

Students essentially learn how to look at a situation, ask the relevant explorative questions, analyse the user needs and the needs of the wider community, present a valid Universal Design solution, manufacture a prototype design and evaluate how universal their final design is. They bring an idea from concept through to manufacture and realisation. The learning is investigative, active and promotes higher order thinking. The activity of Designing and making teaches a student to organise, decipher and communicate their thoughts. With a strong focus on observation, social identity and primary research tasks students are supported in developing their verbal skills and confidence. Students create projects which appreciate the role of design, technology, manufacture and our social responsibility in meeting the needs of a diverse population.

In each strand a selection of tasks is presented allowing teachers the flexibility to choose a design brief that best represents the interests and experiences of their student body. This ensures the course is organic and localised to the needs of individual communities and demographics. Students can see the relevance of their learning and appreciate the positive impact Universal Design can have in their local environment. The strands and case studies presented facilitate the teacher in opening the learning parameters of the traditional classroom out into the wider community. Guest speakers and external visits afford students the opportunity to experience the daily challenges faced by someone with a particular physical, sensory, mental health or intellectual disability. Together with primary observation exercises and

a resource pack of capability simulators students can recognise and experience the limitations which can exist for some.

To ensure that students have the skills to present real-world design solutions the course must also recognise the relationship between Design and Technology. As such relevant elements of the STEM subject stream will be integrated into course strands. Students will explore the basics of Electronics and Control, Materials Technology, Orthographic drawing and Mechanics. This technical knowledge is delivered in conjunction with the principles of Universal Design and National and International social data. By its nature the Universal Design process is a logical and scaffold approach to learning. It requires students to become more autonomous while equally developing their sense of social identity and social responsibility. This course will appeal to Students who are inquisitive by nature and creative. They come to see themselves as designers, problem solvers and future innovators.

Aims and Values

For Students to:

- Recognise social diversity and respect differences.
- Understand the principles of Universal Design and to apply this knowledge practically to broaden the range of usability.
- Learn to question and analyse the world around them: how we engage with and use Products and Services, our Built Environment and ICT. Students will learn and experience the skills required to bring an idea from concept stage through to realisation.
- Employ practical model-making techniques to work through the development and prototyping of their design proposals.
- Develop their communication and organisational skills.
- Cultivate their sense of social identity and social responsibility.
- Recognise the future opportunities and careers which exists within the fields of Universal Design and Technology.
- Become active, autonomous learners.

Statements of Learning

The Creating Designs for our Tomorrows short course links to the statements of learning in the following ways:

Statement: **The student…**	**Examples of relevant learning in the course**
Values what it means to be an active citizen, with rights and responsibilities in local and wider contexts. (SOL 7)	Through Universal Design tasks and relevant case studies students explore the areas social diversity and inclusion. The research tasks are designed to teach students to respecting differences and to recognise their responsibility to society. A concurrent theme of Universal Design within the Built Environment supports students in observing how we engage with elements within our built environment and to propose alternative Designs or approaches.
Values the role and contribution of science and technology to society, and their personal, social and global importance. (SOL 19)	Students also explore material technology and advances in the area of smart materials. Product Analysis tasks and User Trials require students to disassemble products and critically analyse their design and technology features and components and usability

Statement: The student…	Examples of relevant learning in the course
Uses appropriate technologies in meeting a design challenge. (SOL 20)	Strand two emphasises the relationship between Universal Design and Technology. It facilitates learning the basics of electronics and control components and their use in assistive technologies.
Applies practical skills as she/he develops models and products using a variety of materials and technologies. (SOL 21)	Through the course students are required to use practical model making skills to present their design solution. To support the practical manufacture of their design, students learn about basic manufacturing techniques, scale, measurement and orthographic drawing. Practical project briefs and analysis tasks increase in complexity through the strands culminating in a Final Design Project in Strand 4.
Brings an idea from conception to realisation. (SOL 23)	Each strand features Universal Design briefs which require the student to work through the design process stages to bring an idea from concept to realisation. Students are taught visual communication skills and practical manufacture skills to aid in the communication of their design thinking.

Key Skills

The Creating Designs for our Tomorrows short course supports the development of the Junior Cycle key skills in the following ways:

Key Skill	Key Skill element	Student learning activity
Being Creative	Imagining Exploring options and alternatives Implementation ideas Learning creatively	In all strands students will have ample opportunity be creative and explorative. They will be required to design and present drawings and physical artefact which communicating their thinking.
Communicating	Listening and expressing myself Discussing and debating Use digital technology to communicate	In conducting primary research with users, students will develop both their confidence and communication skills. Through peer discussion groups students will present their research findings and design concepts. Students will collate and present their design report using a variety of digital technologies
Managing information and thinking	Being Curious Gathering, recording, organising and evaluating information and data. Think creatively and critically Reflecting on and evaluate my learning	Student will conduct primary and secondary research to interpret a design brief. They will learn to critically analyse and filter this information so as to inform their design thinking. Evaluation is key feature of good design and is critical to the success of the final solution. Students will be supported in learning how to evaluate all design concepts against the user' specifications.
Managing myself	Knowing myself Making considered decisions Setting and achieving personal goals Being able to reflect on my own learning	Social responsibility and social identity case studies Time management and organisation of project resources and stages Personal reflection tasks within the design process In taking ownership of the success of their design projects students become more autonomous and independence

Key Skill	Key Skill element	Student learning activity
Staying well	Being social Being confident Being positive about learning Being responsible, safe and ethical in using digital technology	Participating in group discussions and presenting final Designs to peers. From a research perspective, developing the confidence to engage with members of society typically outside of their daily circle.
Working with others	Co-operating Respecting difference Contributing to making the world a better place Learning with others	Design is a collaborative process and through group tasks students are encouraged to support each other and constructively peer-assess the tasks set.
Being Literate	Writing for different purposes Expressing ideas clearly and accurately Developing my spoken language Exploring and creating a variety of texts, including multi-modal texts	Read, analyse and present research findings. Create user surveys and questionnaires. Conduct user interviews. Create visual presentations and reports to document their project progress. Search and filter information online. Critically evaluate existing products and solutions. Produce a Design Report documenting the progression of their design idea.
Being Numerate	Developing a positive disposition towards investigating, reasoning and problem-solving Seeing patterns, trends and relationships Gathering, interpreting and representing data Using digital technology to develop numeracy skills and understanding	Engage in problem solving. Interpret statistics relating to national and international Universal Design data. Understand and apply the principles of measurement and scale in completing a practical project. Interpret anthropometric data charts. Research and understand findings relating to social, economic and demographic data. Conduct surveys, collate data and present statistical findings. Present measured orthographic drawings.

Course Overview – Topics and Learning Outcomes

Strand 1: An Introduction to Universal Design (*Emphasis on the UD of Products and Services.)

Topic 1.1: Respecting Differences: Population Diversity
Learning Outcomes:

1. Discuss general population diversity and demographics referencing local/ national/ international data * School and wider community.
2. Recognise that in using products and services or accessing our built environment that there exists a range of specific user needs and individual challenges (Case Studies).
3. Recognise their role and responsibilities within society.

Topic1.2: Universal Design Principles
Learning Outcomes:

1. Explore the concept of Universal Design and exemplar material within the fields of: Products and Services, The Built Environment and ICT.
2. Know the 7 key principles of UD.
3. Investigate the usability of a range of products - Product Analysis * DOT Material.

Topic 1.3: An introduction to research and investigation.
Learning Outcomes:

1. Understand the role of primary and secondary research in establishing user needs and specifications.
2. Create a user questionnaire, collate feedback and present research findings.

Topic 1.4: Product Analysis/ Case Study/ Practical project brief. (*Emphasis on UD of Products and Services.

*DOT Material and resources.)
Learning Outcomes:

1. Complete a series of product analysis tasks/ case studies
2. Create and model a design solution to the chosen brief.

Strand 2: The role of technology in Universal Design (*Emphasis on UD within the Built Environment)

Topic 2.1: UD and Social Diversity – Focus on the ageing population
Learning Outcomes:

1. Discuss the factors relating to the ageing global population and the challenges faced in meeting the needs of this sector of society. Students must make reference to local/ national/ international data.
2. Provide examples of UD within their built environment and identify elements/ areas which require focus and modification.
3. Participate in a school trip to a local nursing home. Document their observations and findings in a report.

Topic 2.2: The science of design (STEM).
Learning Outcomes:

1. Explore a range of sensors and electronic control devices which are used in current UD devices/ systems and assistive technologies.
2. Explore the range of materials and their properties available for use in current UD devices/ systems and developments in smart materials.
3. Understand relevant anthropometric charts and integrate this data into their research and design projects.

Topic 2.3: How to communicate design thinking.

1. Present a range of 2D design concepts using a range of sketching and visual communication techniques.
2. Explore a design concept by creating a series of prototype models, using the materials and resources available.
3. Complete a basic orthographic drawing of a final design, reference the scale and associated measurements.

Topic 2.4: Product Analysis/ Case Study/ Practical Project brief. (* Emphasis on The Built Environment. * Tasks increasing in complexity from Strand 1.)

1. Students will complete a series of product analysis tasks/ case studies/ practical project briefs with a focus on UD in the Built Environment

Strand 3: Disability – Equality and Inclusion through Universal Design (*Emphasis on the UD of ICT and Universal Design for Learning)

Topic 3.1: UD and Social Diversity – Focus on Disability.

1. Discuss the challenges met by those with a physical, sensory, metal health or intellectual disability in accessing services and living an independent life: making reference to local/national/ international data.
2. Provide UD examples within ICT products and systems which meet the needs of those with a disability and the wider population.
3. Communicate their understanding of Universal Design for Learning with reference to ICT.
4. Identify areas of ICT which require further attention/ modification to ensure they are more universally accessible.

Topic 3.2: Product Analysis/ Research Case Study/ Project brief. (*Emphasis on UD of ICT and UDL. *Tasks increasing in complexity from Strand 2.)

1. Students will complete a series of product analysis tasks/ case studies/ practical project briefs within the area of UD ICT.

Strand 4: Final Project (*Emphasis on the UD of ICT products and systems.)

Topic 4.1: Universal Design - Project Brief. Students presented with a range of flexible design briefs which they can adapt to their local environment and community.

1. Present a final design project (Design portfolio and artefact) which encapsulated their learning

across the three strands and demonstrates their competency as designers.

Course Delivery and Assessment

The course strands can be delivered as individual units. While the course outline above provides a linear outline of the course strands and topics, teachers may choose to deliver the course in different ways. Two options are set out here for consideration:

Option A:

- The areas of UD within Product and Services, The Built Environment, ICT (UDL) form a commonality across the four strands through a range of subject specific: case studies, research and investigation tasks, user trials and design project briefs. They are not dealt with in isolation. Instead each strand has a particular emphasis towards one of the three subject streams. *ref Topic 4
- Approach is more focused on acquiring UD knowledge and skills and developing student's design competency
- As students progress through the course, the subject content expands and the project briefs become more complex.
- Scaffold approach to learning: Skill and competency-based approach similar to that used in the Programming and Coding short course as opposed to the Digital Media Literacy course which is more focused towards developing awareness of a range of topics; all linked but not co-dependant.
- Introduce a Final Project, Strand 4 for student to demonstrate their understanding of Universal Design and their competency as designers and problem solvers.

Option B:

- Focus strands specifically on the areas of Products and Services, Built Environment and ICT.
- Topics are delivered sequentially.
- This part of the specification will identify the assessment tasks most appropriate to the short course. In short courses as with other curriculum components, teachers engage in ongoing assessment to support and plan for learning.
- Depending on the short course, the kinds of school work likely to be involved include assignments, projects, case studies, performances, spoken word/oral work, practical activities, written pieces and tests/tasks of different kinds, depending on the nature of the learning involved.

Assessment/Weighting		
Strand 1	An introduction to Universal Design Emphasis on Products and Services	20%
Strand 2	The role of technology in Universal Design Emphasis on the Built Environment	25%
Strand 3	Disability – Equality and Inclusion through Universal Design Emphasis on ICT and UDL	15%
Strand 4	Final Universal Design Project Design Portfolio – 20% Artefact -20%	40%

Expectations for Learners

Examples of student work will be used to illustrate the expectations for learners in the short course. These examples will be related directly to a learning outcome or groups of learning outcomes. They will be annotated, indicating whether the work is in line with, ahead of, or behind expectations for learners using the features of quality to make these judgements.

Resources

This part of the specification will identify resources that will support teaching and learning in the short course.

- NDA resource pack of capability simulators.
- ICT facilities.
- Drawing equipment.
- Model-making resources and practical equipment – depends on the teacher delivering the course and room availability and student's prior and current learning i.e. whether the course is taught alongside Technology/ Art/ MTW or science.

Appendix B – Listing of Junior Cycle Key Skills

Key Skill	Key Skill element	Student learning activity
Being Creative	Imagining Exploring options and alternatives Implementation ideas Learning creatively	In all strands, students will have ample opportunity be creative and explorative. They will be required to design and present drawings and physical artefact which communicating their thinking.
Communicating	Listening and expressing myself Discussing and debating Use digital technology to communicate	In conducting primary research with users, student will develop both their confidence and communication skills. Through expert discussion groups students will present their research findings and design concepts. Students will collate and present their design report using a variety of digital technologies
Managing information and thinking	Being Curious Gathering, recording, organising and evaluating information and data. Think creatively and critically Reflecting on and evaluate my learning	Student will conduct primary and secondary research to interpret a design brief. They will learn to critically analyse and filter this information so as to inform their design thinking. Evaluation is key feature of good design and is critical to the success of the final solution. Students will be supported in learning how to evaluate all design concepts against the user' specifications.
Managing myself	Knowing myself Making considered decisions Setting and achieving personal goals Being able to reflect on my own learning	Social responsibility and social identity case studies Time management and organisation of project resources and stages Personal reflection tasks within the design process In taking ownership of the success of their design projects students become more autonomous and independence.
Staying well	Being social Being confident Being positive about learning Being responsible, safe and ethical in using digital technology	Participating in group discussions and presenting final Design to experts. From a research perspective, developing the confidence to engage with members of society typically outside of their daily circle.
Working with others	Co-operating Respecting difference Contributing to making the world a better place Learning with others	Design is a collaborative process and through group tasks students are encouraged to support each other and constructively expert-assess the tasks set.
Being Literate	Writing for different purposes Expressing ideas clearly and accurately Developing my spoken language Exploring and creating a variety of texts, including multi-modal texts	Literacy includes the capacity to read, understand and critically appreciate various forms of communication including digital media.
Being Numerate	Developing a positive disposition towards investigating, reasoning and problem-solving Seeing patterns, trends and relationships Using digital technology to develop numeracy skills and understanding	Develop numeracy skills through activities where students engage in problem solving, interpret statistics relating to national and international Universal Design data and understand and apply the principles of measurement and scale in completing a practical project.

Appendix C – Detailed Course Outline for Teachers

Strand 1: Creating Designs for our Tomorrows

1: What is Design and how does Design impact me and my community?
'Design is not a profession but an attitude' – Laszlo Moholy Nagy. Exploring the term Design and the action of designing.
A simple object we use every day…can I use it; can others use it?
Designing with users not for users: Prior learning and assumptions of Art, Design, Technology and Engineering: What will I learn, what do I already know, what do I want to know and learn? (KWL)
'All we do, almost all the time, is design, for design is basic to all human activity'. Victor Papanek
Introducing a mini design project – Observing the different ways we hold and use a pen.
Creating a simple prototype model and evaluating its success
Exploring Social Identity and Social Responsibility.
Exploring the three main areas of Universal Design: Products and Services, The Built Environment and ICT
How we measure Universal Design. Introducing the Principles of Universal Design – Government agencies and responsibilities NDA, CEUD.
Student Contact time: 8 lessons

Topic 2: Design and Designing - Product analysis and design project.
Lesson 1/10: It's normal to be different. Experience experiments and measuring differences.
Lesson 2/10: Analysing how we use products with a focus on vision and dexterity.
Lesson 3/10: Analysing a task: Identifying stages in using a product which some people might find demanding. Introducing the cutlery design project theme.
Lesson 4/10: Exploring existing cutlery design and alternative ways of lifting, griping and cutting.
Lesson 5/10: Generating design ideas: How to techniques.
Lesson 6/10: Model making and modelling your design ideas – Prototype model
Lesson 7/10: Modelling and evaluating your design idea – Vision and Dexterity focus
Lesson 8/10: Modelling and evaluating your design idea – Design specifications focus
Lesson 9/10: Modelling and evaluating your design idea – UD Principles and Guidelines focus
Lesson 10/10: Communicating your final design idea – Product storyboard and Individual Reflection and Evaluation
Student Contact time: 10 lessons (*1 extra lesson)

Topic 3: Communicating Design Thinking
Visual Communication: Exploring how we can use different styles of drawing to communicate our design ideas. (Orthographic drawing Focus)
Visual Communication: Developing Orthographic drawing skills to include scale, sizes and hidden details.
Visual Communication: Using isometric drawing techniques to present design ideas and record developments
Visual Communication: Applying basic rendering techniques to improve the quality of a sketch.
An introduction to Product Analysis in Design: Using sketching skills to understand a design and communicate its key parts and functions.
Product Analysis in Design: Disassembling a product, recording the component parts and completing a more in-depth analysis.
Product Analysis in Design: Refining a product analysis task with a focus on Universal Design and developing sheet presentation techniques.
Tasks to extend the Product Analysis Topic: Option 1: Redesign and modification of chosen product through sketching or model making. Option2: User testing with a focus on vision and

dexterity. Option 3: Strand 1 review and reflection with a focus on learning and experiences.
Student Contact time: 8 lessons

Strand 1 End
26 lessons approx. * 2 extra lessons slack time on Topic 2 or Topic 3 Visual Communication = 28 Lessons Total Strand 1

1.2.10:
AFL Evaluation lesson could be extended to allow all students time to create a digital presentation of the project stages and to make an individual presentation to the class. Opportunity for constructive expert assessment and development of communication skills.

1.3.5
Four lessons are allocated to a Product Analysis task however this can be extended or reduced depending on teacher's preferences, material and resources, timing and student's competency. Each of the lessons include a short visual communication demonstration to further refine student's presentation skills. The project could extend to a redesign and model making task or students might choose to focus their Individual project design brief in Strand 3 within this area.

Strand 2: Universal Design and Technology – Built Environment focus

(Topic presents opportunities for Team Teaching, Cross curricular links, inviting guest speakers or subject content experts to meet with the group)

Topic 1: STEM – An introduction to Materials, Manufacture and Mechanical systems.
STEM Topic – Materials Technology Focus - An introduction to materials used in Design and Technology and advancements in Smart materials
STEM Topic – An introduction to manufacturing, how things are made - advancements in 3D Printing **(**Opportunity for external visit to observe 3D Printing Demonstration – DIT Link)
STEM Topic – Mechanisms and Movement Focus - Explore the range of the basic movements. What mechanical components we can use to achieve basic movement and how on a basic level can we introduce movement into our design projects?
STEM Topic – Practical application of mechanisms and movement in a prototype model.
Student Contact time: 4 lessons

Topic 2: My Built Environment - Design Project
Discover: Introducing the Built Environment Design Project – Group and individual analysis
Discover: How we approach and think about a design project – Introducing the Double Diamond design model
Discover: Introducing Primary and Secondary research and emphasising the importance of observation at the Discover stage of Universal Design
Discover: Recognising diversity within my school community – exploring stereotypes and perceptions of disability
Discover - Understanding Users: Exploring interviews, questionnaires and on-line surveys
Discover - What can I learn from interviews and questionnaires? Understanding and presenting this feedback using ICT. Secondary Research: Existing locker designs and systems –
Define - Research review and reflection – How can I use this knowledge and understanding to move forward? Writing a revised individual design brief and design specifications
Develop – Start Concept design ideas. Employing creative thinking strategies and referring to individual design brief and specifications to guide design decisions.
Develop: Creating a prototype model to represent an idea in 3D. AFL Expert. Expert Review and methods for recording design decisions and developments
Develop / Deliver – Creating a more developed prototype model using the materials, equipment and time available. Iterative reflection encouraged using evaluation strategies.
Develop / Deliver - Creating a more developed prototype model using the materials, equipment and time available. Review the usability of the design and adherence to relevant UD principles,

Standards and the student's individual design brief and specification.
Deliver - Creating a more developed prototype model using the materials, equipment and time available. Discuss testing and conducting a user trial from the sample group identified in Discover phase of research.
Deliver – Evaluating the experience and documenting the learning journey - Usability review, UDL and AFL self-assessment task
Student Contact time: 13 lessons

Topic 3: STEM – An introduction to Electronics and Control systems
STEM Topic – Electronics Focus - Possibly integrate practical design brief with theory content and run in conjunction.
STEM Topic – Control Focus - Possibly integrate practical design brief with theory content and run in conjunction.
STEM Topic – Electronics and Control Focus – Practical application of Electronics and Control in a short design task
Student Contact time: 13 lessons approx

Strand 2 End
20 Lessons
Extra lessons slack time on Topic 1 Mechanisms or Topic 3 Electronics = 22 Lessons Total Strand 2
Topic 2.2 My Built Environment Project:
Students should experience design as an iterative process. Therefore, if there are stages in a student's project where further research and investigation is required, students should be encouraged to do so and not follow the project in a purely linear manner.
The depth and treatment of the model-making task will vary depending on the classroom environment, the materials and model-making equipment available and the teacher's experience and preference– Art room/ Technology/ MTW, MTM workshop space/ Standard classroom
2.2.13:
AFL Evaluation lesson could be extended to allow all students time to create a digital presentation of the project stages and to make an individual presentation to the class. Opportunity for constructive expert assessment and development of communication skills.

2.3.1 – 2.3.3: STEM
This content can be dealt with on a purely introductory level and the teacher can choose to focus on specific electronics, available to students, later in the course. Alternatively, the teacher can decide to extend this topic to expand on scientific elements of electronics: voltage, resistance, capacitance etc.

Strand 3: Designing accessible spaces and services – UD for ICT
Topic 1: Universal Design for ICT
Information is only useful when it can be understood – Muriel Cooper. An introduction to Universal Design for ICT.
Exploring simple, practical techniques to improve user's experiences with ICT products, services and systems
Digital Design Project - Discover Stage Lesson 1/6 lessons - An introduction to the ICT design project briefs and the opportunities for digital and physical model outcomes. KWL research plan
Digital Design Project - Discover/ Define stage Lesson 2/6 – Discover more about our chosen area of ICT and our users. Defining our individual design brief. Support Booklet created to guide Teachers and Students through the project stages)
Digital Design Project - Define/ Develop stage Lesson 3/6- Writing a more defined project design brief and exploring initial design ideas and directions
Digital Design Project - Develop/ Deliver stage Lesson 4/6- Modelling a digital design idea or creating a physical model of a design for a screen, an interface or an ICT product, service or system.
Digital Design Project - Develop/ Deliver stage Lesson 5/6- Continue Modelling design idea, SWOT analysis AFL task.
Digital Design Project - Deliver Stage Lesson 6/6 - Evaluating the experience and documenting the

learning journey - Usability review, UDL and AFL self-assessment task

Digital Design Project: 6 Lessons in total, 3-4 lessons to manufacture a digital or physical prototype, depending on ICT resources available to class and student ICT competency
Student Contact time: 13 lessons

Topic 2: Universal Design and my community
External Visit: Preparatory lesson which explores the key criteria in the design and accessibility of public buildings and spaces. (Focus on Ageing, ICT and Service Design)
External visit: Record Individual observations and reflections
External visit: Class debrief, record feedback and create presentation. (Opportunity to focus on active citizenship and engaging with community and local political representatives)

Alternatively, the Teacher could organise a guest speaker with experience relevant to the course content or a speaker who has experienced limitations due to poor design.
Student Contact time: 3 lessons

Topic 3: Design for Change - Project/ Report
Design for Change – A group design project which encourages students to employ designs thinking to address an issue within their local community (Focus on ICT and Service design).
Lesson 1: Discover stage Lesson 1/8 lessons: An introduction to the Project briefs and the opportunities for digital and physical model outcomes.
Design for Change: Discover/ Define stage Lesson 2/8 – Discover more about our chosen area and our users.
Design for Change: Define/ Develop stage Lesson 3/8- Defining our individual design brief. Start to explore design ideas and record decisions.
Design for Change: Develop/ Deliver stage Lesson 4/8- Further design development through concept sketching and prototype model making. Recording all design decisions together with self and expert evaluation.
Design for Change: Develop/ Deliver stage Lesson 5/8- Start making refined prototype model to represent developed design – Complete reflective SWOT analysis AFL task
Design for Change: Develop/ Deliver stage Lesson 6/8- Continue modelling design idea and complete reflective AFL expert review.
Design for Change: Develop/ Deliver stage Lesson 7/8- Continue modelling design idea and complete Design Specification review.
Design for Change: Deliver stage Lesson 8/8 – Group design presentation, Usability review, UDL and AFL self-assessment task. (Digital presentation extension task)
Student Contact time: 8 lessons

Stand 3 End
19 lessons approx.
* 1 extra lessons slack time on Topic 1 or Topic 3 = **20 Lessons Total Strand 3**

3.1.3– 3.1.8:
The depth and treatment of the digital/ physical model-making task will vary depending on the classroom environment, ICT resources, materials and model-making equipment available and the teacher's experience and preference– Art room/ Technology/ MTW, MTM workshop space/ classroom

3.1.8:
AFL Evaluation lesson could be extended to allow all students time to create a digital presentation of the project stages and to make an individual presentation to the class. Opportunity for constructive expert assessment and development of communication skills.

Strand 4: Universal Design Final Project
(General UD Design Template provided to record progress through the individual stages of the project)

Topic 1: Learning and experiences audit and preparation for Final Design Project
The importance of reflection in good design practice: Course Audit – Review JCSA statements of learning, key skills and student' experiences and competencies. Preparation for final project.
Student Contact time: 1 lesson

Topic 2: Final Universal Design Project
Suggested Project Themes. (Reword, refine and tailor project briefs to suit student group)
Sport: Improving access and engagement for all in sport.
Education: Developing an education aid to support all student's learning and understanding.
Transport: Improving transport systems and services in my local area.
Social Design: Designing products, systems and services to improve basic human needs. Focus on community and active citizenship. (Refer to Design for Change Project suggestions)
Open Brief: Students propose an individual project design brief based on their experience and observations through the Universal Design course. (Refer to external visit or community project)

Lessons: 4.2.1 – 4.2.14 (Suggested timings and lesson sequence)
Discover: Explore range of design briefs and analyse opportunities for digital and physical model outcomes and individual areas of interest.
Discover: Research the design situation or problem. Discover our Users and their needs and wants. Create a KWL Research Plan
Discover: Complete primary and secondary research of existing solutions, problems and technologies
Define the direction of the project. Work with users to create Individual Design brief and design specifications. Start to explore concept design ideas and possibilities
Develop: Continue to explore concept design ideas and record decisions. Model prototypes solutions.
Develop: Further design development through concept sketching and prototype model making. Recording all design decisions together with self and expert evaluation. Work with user to develop the design.
Develop a plan of manufacture for refined design. Start manufacture.
Develop: Manufacturing stage- Continue making the design and communicate with the user regarding design changes. Record all conversations and decision points.
Develop: Manufacturing stage- Continue making the design and complete reflective SWOT analysis AFL task
Develop: Manufacturing stage- Continue making the design and communicate with the user regarding design changes. Record all conversations and decision points.
Develop: Manufacturing stage- Continue making the design idea and complete Design Specification review.
Deliver finished prototype design and work with user to test. Record user observations and consider and if feedback is constructive, apply changes.
Deliver project evaluation: AFL self-evaluation tasks, Universal Design success review and explore Design Modifications
Deliver project presentation to class group and complete AFL expert review.
Student Contact time: 14 lessons approx.

Topic 3: Course review and exploring future opportunities
Course Review and Learning Audit: What next……Universal Design in TY, Leaving Certificate and beyond.
Student Contact time: 1 lesson

Strand 4 End
14 Lessons approx.
2 x extra lessons slack time to review, evaluate and moderate the course= 16 Lessons Total Strand 4

The objective of this final project is that students summarise their learning and experiences of Universal Design.
Their chosen project should offer opportunities for them to engage with their community and to recognise that good design practice can bring about positive change. Teachers can choose to select a project design brief from those listed or can choose to select a more open thematic brief where students can focus on an area of individual choice. Students will produce a refined prototype model and a design portfolio documenting the project.

Like all topics in the course, the depth and treatment of this project will vary depending on the space the course is taught – Art room/ Technology/ MTW, MTM workshop space/ Standard classroom, the materials and modelling equipment available, student's practical competency and teacher's preference. Teachers could also consider a digital ICT model, offering the students different means to express their design thinking.

UD Short Course Total Lessons
86 Lessons Approx. (80 minutes/ Double lessons) = Approx. 110 hours (100 hours- JCSA Short course requirement)

Appendix D – Short Course Sample Resources

Sample Teacher Resources – Lesson Overview

Strand: 2	Universal Design and Technology – Built Environment focus
Topic 1:	An introduction to Materials and Mechanical systems in Technology
Lesson: 2.1.1	**An introduction to materials used in Design and Technology - *(TT, STEM Crossover)***
Learning Intentions	• To understand that there are five principle material groups • To acknowledge that in choosing a material for a design one must consider how the material behave in different environments and situations. • To recognise the advancements in Materials Technology, specifically smart materials and wearable technologies
Lesson Introduction	This lesson is an introduction to materials used in Design and Technology. It explores through PP and demonstrations the material groups and advancements in Smart materials and Wearable Technologies. • Group Task: List all the different materials you can see in classroom- Subdivide into Natural and Synthetic materials • Explore/ Demonstrate Material groups and properties using material samples: o Five principle material groups: Natural, Plastics, Metals, Woods, Composite and Smart o Factors to consider: How a designer chooses a particular material: Product and Architectural examples o Explore what is meant by properties of material: how a material behaves in different situations, different users o Summary Task: Why is this important for students/ designers to know about materials and developments in materials technology? • Developments: Introduce Smart Materials – Intelligent materials which respond to changes in their environment- Material samples/Video links • Complete Materials Activity sheet and Summary– UD focus
Time	80 minutes (Could extend to another double lesson to include developments in materials technology - research task)
Resources	• Resources: PP. Material groups and classification o Physical resource pack: Material samples • Hand-out : Material reference factsheet and key terms/ language
Hyperlinks	Wearable technology – fashion, sport, transport links

Sample Teacher Resources - Teacher Instructions

Lesson instructions: Step by step

Recap previous lesson:

Initial Product Analysis - representing the remote control in orthographic and isometric views

Review homework/ Independent Learning Task:

Orthographic / Isometric drawing of chosen product.

Lesson learning intentions

Activity

1. Group Demonstration and Discussion:
    a. Recap: What is *Product Analysis* who uses it and what can we learn from the process? Link to students as consumers and understanding how and why the products they use are designed in a particular way.
    b. Lesson focus is a more in-depth Product Analysis If possible disassemble the remote control to learn more about its design and manufacture. *(See Lesson PP for exploded drawing of remote control.)*
    c. Demonstrate disassembling the product – Using screwdrivers, cutting the casing and photographing mechanical sections and the housing of electronic components.

2. Task: Disassemble the remote control to learn more about it.
    1. Use the lesson worksheet make a detailed study of the component parts or create a digital presentation, recording your analysis
        a. Record your findings and observations in relation to: Function, Design, Usability, Manufacture, Components
        b. Sketch/ photograph the component, including the casing, housing and power supply. Give each part or component a sub-heading.
    2. When completed compare and contrast your findings with your partner's findings from their chosen product. (Think, Pair, Share)
    3. Recap: Visual Communication techniques.

3. Debrief & summarize task:
    a. Group feedback and thoughts relating to component size, mechanical and electronic housing and use of space inside the product. Could discuss the concept of *Form follows function* or vice versa depending on the product chosen.
    b. Through Product Analysis we learn more about the product, the technology and about what the customer needs. We can use this information to modify and improve the design if required

Homework/ ILT: Finish Worksheet. Could add digital images or create a digital story of the product.

Lesson 2.2.10: Reflect and Review Worksheet

Stage 1: List any changes, however small, you have made to your design during model making ….is your design now different to you drawing?

Use Post it Notes as a quick way to record any changes (Write as bullet points or sketches later)

Can the overall usability of your design be improved now that you start to see it in 3D? Reflect and think about Universal Design and the Principles listed…….. *Use Post it notes or quick sketches to record your thoughts*

UD Principle 1: Equitable Use	UD Principle 7: Size and Space for Approach and Use	UD Principle 4: Perceptible information
• The design is useful and marketable to people with diverse abilities.	• Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility	• The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

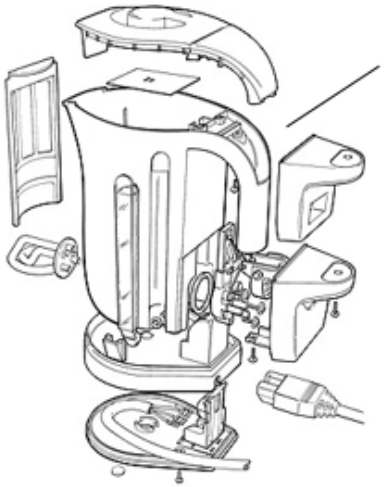
Bringing Universal Design to School

Lesson 1.3.5
Examples of some products we might choose to analyse and find out more about their designs?

NDA

Creating Designs for our Tomorrows

Lesson 1.3.5
Examples of some products we might choose to analyse and find out more about their designs?



Exploded drawing

Further Reference:

- www.madehow.com/Volume-7/Electric-Tea-Kettle.html
- https://en.wikipedia.org/wiki/Kettle
- Kettle types - http://www.remodelista.com/posts/10-easy-pieces-electric-tea-kettles

NDA

Creating Designs for our Tomorrows

Lesson 1.3.6:

Disassembly, investigation and product analysis

Task:

1. Disassemble the remote control. Use the space below make a detailed study of the component parts or create a digital presentation to record your thoughts. See suggested subheadings in the table below.
2. When completed compare and contrast your findings with your partner's findings from their chosen product. (Think, Pair, Share)
3. Extension: Following your product analysis and observations can you recommend five key design tips in designing remote controls?

Form and Function	*Components*	*Design / Form / Shape*	*Usability / how easy is the product to use?*	*Manufacture*
What is the function and purpose of the product? If you can take the product apart or disassemble:	List/ Sketch/ Record the different parts of the product and how do they fit together. Can you see how the product works? Electronics and Control (ICT research might be required to complete this section).	Why is it designed the way it is? Is the shape determined by the size of components like the battery, electronics etc. Are there any interesting features? How is shape, form, colour, texture and decoration used in the design?	Who uses this product? Can it be access, understood and used by all? If not why and could this be improved? Are all controls and features used? If not why? Refer to vision contrast and dexterity simulators.	What materials components and processes are used to make the product?

Appendix E – JCSA Short Course - Glossary of Terms

Terminology

Cooperative Learning - Group work and active learning: using graphic organisers and instructional.

Differentiation - Adapting the learning intentions of a lesson so that a wider network of students can access the content and the tasks set. Inclusive tasks.

Formative Assessment - Student and their teacher use the criteria for success to reflect on their learning and to plan their next steps, provide feedback - continual assessment.

Framework for Junior Cycle - Framework used by schools to plan and develop their Junior Cycle programmes.

Full Course - English, Maths and Gaeilge are compulsory subjects and must be included in a school's Junior Cycle programme. All require 240 hours minimum of student engagement. 200 hours all other subjects.

Inquiry Learning - Learning through investigation, analysis and experimentation.

Key Skills - Key Skills – 8 key skills including the skills of literacy and numeracy. Key skills help learners develop knowledge, capabilities and attitudes that support them in learning how to learn and take responsibility for learning.

Learning Objectives - Learning Objectives are defined in the Strands and Topics with Learning Intentions used to describe individual lessons.

Prior Learning - Prior and knowledge and experience the students comes to the lesson with.

Short Course - 100 hours of student engagement and specified at a common level.

Statements of Learning - 24 statements of learning describe what Junior Cycle students should know, understand, value and be able to do having fully engaged with the Junior Cycle programme.

Specification - The specification outlines the learning objectives to be achieved (replaces the term syllabus). Specification refers to both subjects and short courses.

Strand - The strand outlines what the student will learn in that section of the course. There should be a maximum of four strands and these may be further subdivided into not more than four topics.

Subject Specification Phases - Phased implementation of Junior Cycle subject specifications (Art Phase 4 2017-2018 for certification 2020, Technology Subjects Phase 6 2019-2020 for certification 2022).

Topic - A maximum of four learning outcomes for each Topic in each Strand.

Abbreviations

AfL - Assessment for Learning: AfL focuses on using assessment information from the learner in planning the next steps in their learning and development.

ASTI - Association of Secondary Teachers of Ireland.

CPD - Continuing Professional Development: Training and in-service courses for Teachers.

DES - Department of Education and Skills.

EAL Students - English as an additional language.

G&T Students - Gifted and Talented students – extension tasks.

ILT - Independent learning task / homework.

JCSA - Junior Cycle Student Award.

JCSA L2 - NFQ Level 2 Learning Programme for students who have general learning disabilities in the higher functioning moderate and low functioning mild categories.

JCT - Junior Cycle for Teachers: CPD Support service of the Department of Education and Skills - supporting schools in implementing the new Junior Cycle Framework.

NCCA - National Council for Curriculum and Assessment.

NFQ - National Framework of Qualifications (JCSA L3 -Level 3).

PDST - Professional Development Service for Teachers: Teacher support service under the remit of the Teacher Education Section of the DES.

PLU - Priority Learning Unit: Designed for Level 2 learning programmes to develop the basic social and pre-vocational skills of the students involved.

QQAI - Qualifications and Quality Assurance Ireland.

SEN Students - Students with Special Educational Needs.

SOL - Statements of Learning.

STEAM - Science, Technology, Engineering, Art and Maths.

STEM - Science, Technology, Engineering and Maths.

TUI - Teachers Union of Ireland.

QQAI - Qualifications and Quality Assurance Ireland.