



HCI Pillar 3 Innovation in Action

November 2024



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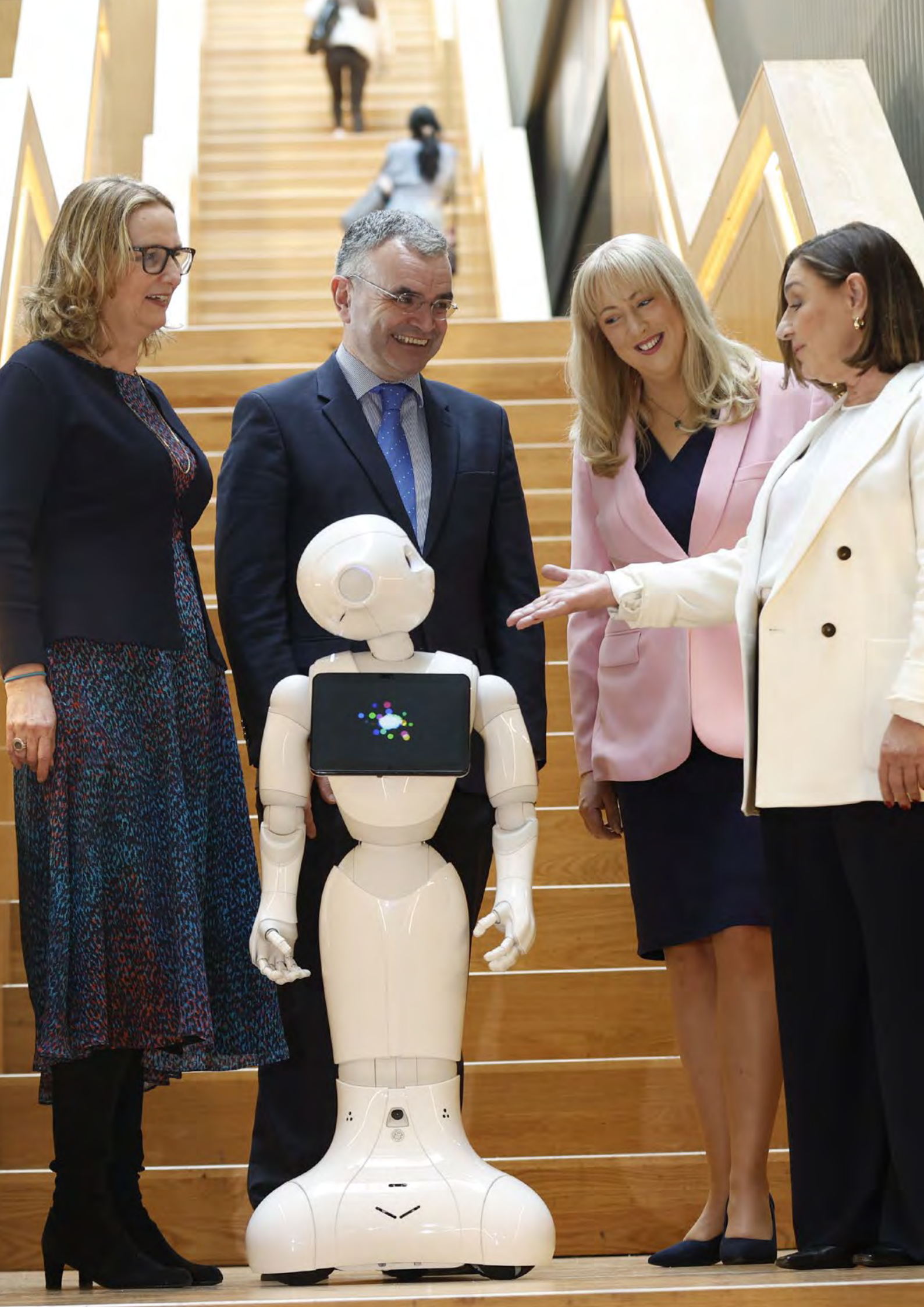
Project Logos



HCI Pillar 3 Outputs

Table of Contents

Introduction	5
The Advance Centre	6
AMASE	8
Building Change	10
CIRDAS	12
Convene	14
Creative Futures Academy	18
Cyber Skills	20
DASBE	24
DCU Futures	26
Designing Futures	28
Enabling Future Pharma	30
Funds Academy	34
GROWTHhub	36
Higher Education 4.0	40
iEd Hub	42
IKC3	34
IMI4	46
MicroCreds	48
REEdI	50
Recognition of Prior Learning	52
Sustainable Futures	54
Trinity Next Generation Teaching and Learning	56
UL@Work	58
Virtual Labs	60
Appendix	62



Introduction



In 2020, the National Training Fund made an investment of €208 million over five years in the Human Capital Initiative's Pillar 3 Innovation and Agility programme. It did so with

support for future skills focused project teams that sought deep collaboration between enterprise and the higher education sector in important economic areas such as cybersecurity, construction, and medtech.

As this brochure highlights, the fruitful innovation and impact of this investment – principally in enterprise focused people – are evident for all to see and experience.

Building on existing enterprise engagement, HCI projects report over 70,000 enterprise engagements. For example, there are now numerous instances of enterprise-HEI innovation and collaboration on the co-design and co-delivery of courses. Traditional learning formats now sit alongside enterprise ready curriculum development and other dynamic and agile learning activities such as hackathons, ideation workshops, innovation clubs, entrepreneurship workshops, and challenged based learning.

Open incubators and enterprise centres are exposing learners to cutting edge innovation and facilitating the creation of future skills and jobs. While across various projects we see technology-mediated innovations such as AI-enabled software services, quantum computing, digital sculpting, 3D printers, immersive hubs and drones, as well as virtual and augmented reality, producing graduates with work ready skills.

In areas such as RPL, micro-credentialing and transversal skills, we are seeing transformative system level innovations being introduced into the higher education system that are already affecting tens of thousands of learners and companies. These system improvements, and other transformations in areas such as creativity, sustainability and additive manufacturing will continue to reverberate beyond the lifetime of the projects.

All this innovation is based on the principle that close academic and enterprise staff collaboration produces skills synergies and innovations that facilitates education in ways that are responsive to the needs of the economy, learners and society. And it is no surprise that HCI project innovation and agility is now attracting much interest and admiration.

None of this success would have been possible without NTF funding. Nor would it have been possible without the creative and open-minded collaboration between enterprise and the dynamic teams who make up the twenty-four HCI Pillar 3 projects. It is people who are driving this innovation, who are building these future skills, and they deserve our congratulations.

A handwritten signature in black ink that reads "Vivienne Patterson". The signature is fluid and cursive, with a large, stylized 'V' at the beginning.

Dr Vivienne Patterson
Head of Skills and Engagement

The Advance Centre

Lead Institution University College Dublin

Partner Institutions Atlantic Technological University, Technological University Dublin

Project Summary

The Advance Centre is a collaboration between UCD, ATU and TU Dublin, created to further professional learning opportunities in the field of Digital Transformation. Digital Transformation underpins development and growth in multiple sectors and as such, is represented by 11 different themes in the Advance Centre. These themes include eight application subjects in the areas of: digital manufacturing, data in context, digital agriculture, AI in medicine, health data analytics, quantum engineering, financial maths and advanced electronic design. These are supported by the three core topics of data science, cyber security and software engineering that underpin the fundamentals in each of these areas. The courses and programmes will focus on the needs of graduate-level learners, i.e. QQI levels 7 to 9, and will support conversion from non-technical backgrounds. The Centre will support flexible learning by awarding skill-based qualifications in micro-credentials, to CPD certificates, to graduate certificates, to graduate diplomas, through to master's.



Project Objectives

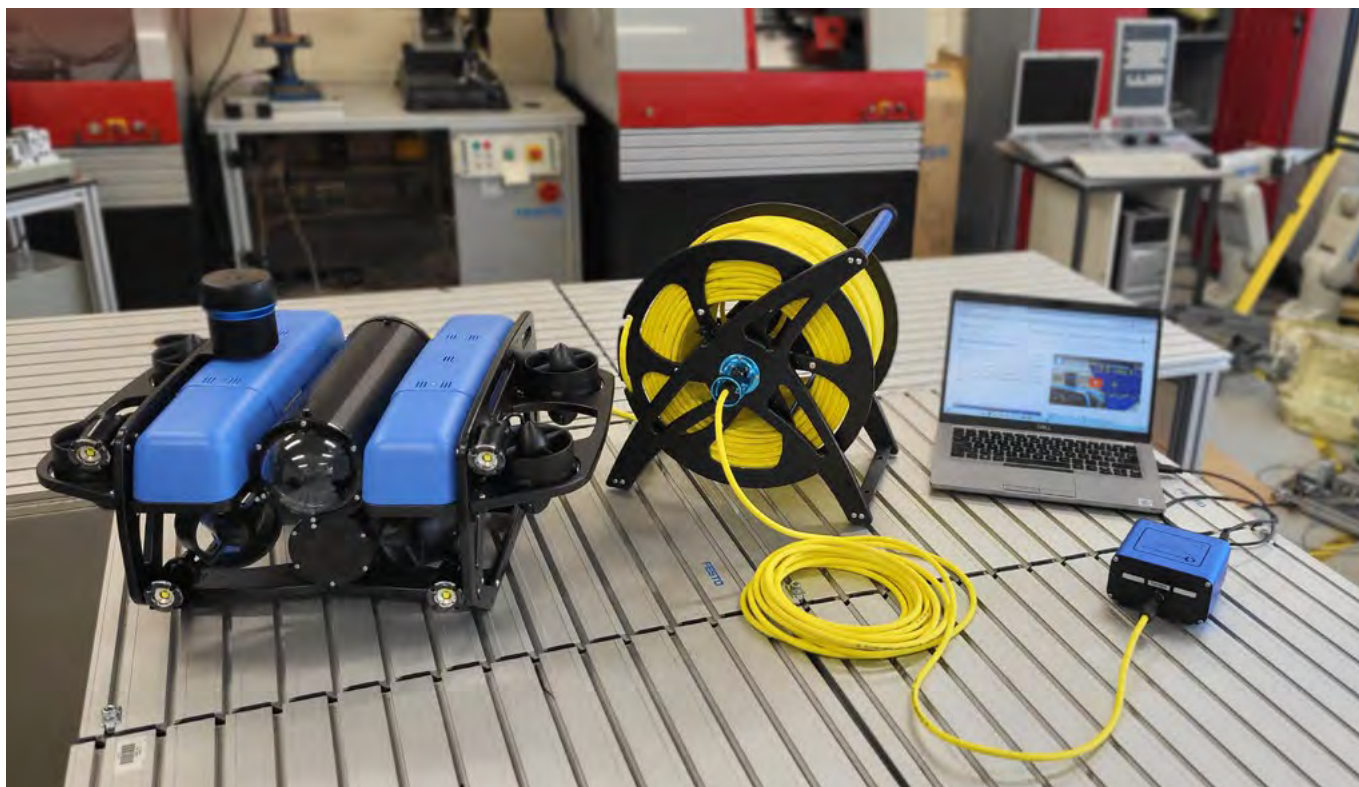
The key objective of the project was to create a curated offering of part-time and full-time learning opportunities for professional learners in the area of digital transformation. In terms of project KPIs, this focused on the ability to enrol in over 200 different courses from micro-credentials to masters programmes. Another key focus was increasing the overall learner capacity within the HEIs through the expansion of existing courses, as well as the creation of new ones to cater for a broad range of enterprise partners. Learner satisfaction and completion rates of courses are being assessed to determine the efficacy and longer term applicability and sustainability of these types of offerings.

In order to support these KPIs, a number of operating objectives have been outlined and met based on project milestones:

- Create the Advance Centre brand and market the new learning offerings
- Creating online and blended delivery ethos in UCD
- Policy and governance to enable creation of micro-credentials and stackability (ongoing)
- Integration of flexible offerings with HEI systems (UCD, ATU, TU Dublin)
- Inter-project collaboration
- Business Development role to promote broader activities

Project Outputs

One of the first project outputs was the creation of the Advance Centre brand and website through which the wide range of courses were offered by the three HEI partners across the 11 themes. Alongside brand creation, the marketing activities promoted awareness of new flexible learning opportunities for part-



time professional learners. Marketing campaigns were created to promote the wider HCI Pillar 3 activities as well as overlapping activities in other projects such as MicroCreds, Higher Education 4.0 and Convene for example.

Although a significant portion of the project course portfolio existed before the start of the project, they were not set up to be taken in a flexible or part-time way. The overall portfolio was adapted to offer new blended and online learning opportunities. An 'Ed Tech Toolkit' was shared with academics and used to adapt existing content and create new courses. Significant work has been undertaken on the background activities required to enable enrolment in one-off modules and deliver supporting and reporting systems that focus on learners taking short courses.

A range of new micro-credentials and programmes have been launched in the HEIs as a direct result of the HCI Pillar 3 funding. Two examples of new programme configuration are the Diploma in Quantum Engineering and the MSc in Cyber Security. Diploma in Quantum Engineering is based on one core module and 3 other modules, selected from 8 options, offered from 5 different Schools. This reflects the interdisciplinary nature of the topic and also gives the learner power to select the most applicable content for their skill needs. The MSc in Cyber Security is created as a pathway programme, with the ability to take all modules as micro-credentials with the certificate being aimed at management roles, the diploma aimed at practitioners and the full MSc for in-house experts.

Most Innovative Achievement

Due to the broad remit of the Advance Centre across 11 themes, the success of the project is built on a number of interconnected activities. The 'build it and they will come' approach was not immediately successful as HEIs and Industry tried to understand the changing learning landscape. Courses created to meet the new emerging skills gaps were integrated into existing programmes as core and elective options to ensure minimum operating numbers were achieved. This had the added benefit of giving taught graduate programmes more varied and interdisciplinary content. All of this was supported in the background through integration into new HEI systems and structures to ensure the learner journey is curated from application to completion. Further benefits will be realised through new capital equipment that form the backbone of programmes such as MSc in Digital Technology for Sustainable Agriculture (UCD) and MSc in Robotics and Intelligent Manufacturing (UCD) as well as expanding the capabilities in the BEng in Robotics and Automation (ATU). These industry relevant facilities will be available to both undergraduate and postgraduate learners and are a good representation of the broader impact of the HCI Pillar 3 funding.

AMASE

Additive Manufacturing

Advancing the South East

Project Summary

The AMASE project has made significant strides in advancing Additive Manufacturing (AM) education in Ireland, offering flexible, industry-aligned training programmes. The BSc in Additive Manufacturing is now in its third cohort with 20 students enrolled, and 4 more students are participating in the fully online, self-paced micro-credentials in AM. These programmes provide a practical, accessible pathway for learners to gain essential skills in this rapidly evolving field.

AMASE has built strong, sustainable partnerships with industry leaders like Stryker and Boston Scientific, ensuring the curriculum meets real-world needs and that students gain hands-on experience through collaborations, site visits, and workshops. This industry alignment strengthens graduate employability and ensures relevance in regulated industries.

In addition, AMASE supports broader integration of AM knowledge within SETU, contributing to the Bachelor of Engineering (Honours) programme and advancing the development of an MSc in Additive Manufacturing (Level 9), further embedding AM expertise across disciplines.

Project Objectives

The AMASE project aims to revolutionise Additive Manufacturing (AM) education by providing flexible, industry-driven training that addresses the skills gap across key sectors such as medtech, aerospace, bio-pharma, and precision engineering. Central to the programme is the delivery of a BSc in Additive Manufacturing, now in its third cohort, along with micro-credentials in AM, which offer self-paced, fully online learning to meet the needs of a diverse student body.

A primary objective is to align educational content with real-world industry demands, achieved through strong partnerships with key companies such as Stryker, Boston Scientific, Bausch & Lomb, Jabil,

Sulzer Pumps, and Water Technologies. These collaborations are critical for co-designing course content, validating projects, hosting workshops, and offering site visits, ensuring students gain practical, hands-on experience relevant to industry needs.

Another significant goal is the expansion of AM expertise within SETU's academic offerings. AMASE contributes to the Bachelor of Engineering (Honours) programme and supports the development of an MSc in Additive Manufacturing (Level 9). Through these initiatives, AMASE ensures that AM knowledge is embedded across multiple levels of education, equipping graduates with the advanced skills required to innovate and lead in high-tech industries.

Project Outputs

The AMASE project has delivered a range of impactful outputs, driving innovation in Additive Manufacturing (AM) education and forging strong connections with industry.

- **Student Enrollment and Programme Growth:** The BSc in Additive Manufacturing now has 20 students in its third cohort, demonstrating sustained interest in the field. Additionally, 4 students are completing micro-credentials in AM, delivered fully online and self-paced, expanding access to a wider and more diverse range of learners, including working professionals.
- **Industry Collaboration and Practical Experience:** Key collaborations with Stryker, Boston Scientific, Bausch & Lomb, Jabil, Sulzer Pumps, Water Technologies, and Stratasys have been instrumental in co-developing course content and offering students hands-on learning through site visits, workshops, and industry-led lectures. These partnerships provide students with real-world insights and exposure to cutting-edge AM technologies. Industry experts also serve as project validators, bridging the gap between academic learning and practical application.



- **Curriculum Integration and Knowledge Transfer:** AMASE's educational impact is not confined to its standalone programs. It has contributed to AM-focused modules in the Bachelor of Engineering (Honours) curriculum and is involved in the validation of a forthcoming MSc in Additive Manufacturing (Level 9). These efforts ensure the transversalisation of AM expertise across different educational levels, fostering a comprehensive learning environment.
- **Outreach and Dissemination:** AMASE has engaged in extensive dissemination, with participation in key events such as the Toys for Engineers Expo. The project has also leveraged virtual reality to demonstrate AM technology and enhance learning experiences. Its media campaigns and digital outreach, including radio interviews and social media promotions, have reached thousands of prospective students, industry stakeholders, and academic peers, amplifying the project's visibility and impact.

These comprehensive outputs ensure AMASE's role in building a workforce equipped with essential AM skills for future industry needs.

Most Innovative Achievement

A highlight of the AMASE program's innovation is the journey of Keith Tracey, a member of the first cohort. Entering through the RPL system, Keith's vision—"This course is going to radically change the direction of my life"—has become a reality. With the skills acquired through AMASE, he launched a successful 3D printing business specializing in advanced AM solutions. He is now completing Phase 2 of the New Frontiers programme, a leading national startup accelerator.

Keith's success is more than just entrepreneurial—it exemplifies the circular economy in education. He now plays a role in the AMASE programme, participating in workshops and guiding students in our 3D printing lab. He was also instrumental in developing a pilot VR workshop, where AMASE explored the possibilities of AI and VR to educate students remotely and provide access to AM equipment not available on campus for hands-on workshops.

His contributions come at a critical time, as experts in AM are rare, and finding those willing to educate the next generation of engineers is even rarer. Keith's journey from student to industry leader, and now educator, showcases the transformative power of AMASE, enriching the program and shaping the future of Irish engineering education.

Building Change

Designing A Resilient Future Through Architecture Education

Lead Institution Technological University Dublin

Partner Institutions Atlantic Technological University, South East Technological University, University of Limerick, University College Dublin, University College Cork, Munster Technological University

Project Summary

The built environment accounts for a high proportion of greenhouse gas emissions, including both operational emissions and embodied emissions associated with the construction of buildings. Design and construction impacts on material resources and has consequences for the environment. Due to population growth we are facing a housing challenge internationally. The architecture, engineering and construction industry urgently requires graduates equipped to address these issues.

To meet this challenge Building Change is reconfiguring Irish architecture education towards a sustainability focus through a strategic partnership of the six Schools of architecture in Ireland, to ensure graduates are empowered with the knowledge, skills and mindset to address the sustainability challenge society faces.

To do this we need to refocus our approach to education, support academic staff to acquire the knowledge and skills to do this, whilst engaging proactively with our professional body The Royal Institute of the Architects of Ireland (RIAI) and with professional practice, industry, communities, and policy makers.

Project Objectives

Architectural education requires graduates to practice ethical responsibility to society, the economy, and the environment. The climate emergency facing society demands a radical response. The UN SDGs, and government policy, challenge architecture educators to rethink and reformulate Irish architectural education.

Building Change follows an agile collaborative and co-learning approach with staff, students, professionals, industry and community to engender the knowledge and skills necessary to reduce the carbon impact of construction and demonstrate the societal value of inclusive and resilient design.

Through the lens of the UN Climate Action and Sustainable Housing SDGs students and lecturers gain a broader understanding of the global challenges society faces.

The project builds on expertise and interests of the six schools of architecture, TU Dublin, UCD, SETU, CCAE, UL and ATU, and comprises three strands: 1) a critical needs analysis, 2) an 'Educating the Educator' programme building knowledge capacity, addressing practical skills and pedagogical principles and 3) pilot projects in the Architectural Design Studio (ADS) module as curriculum change testbeds.

An overarching goal is our engagement with the RIAI to support the revision of their accreditation requirements for architecture degree programmes such that they incorporate the necessary sustainability concepts and requirements.

Project Outputs

To create sustainable, inclusive and beautiful buildings architects employ a broad range of creative, technical and professional knowledge and skills. However, in a changing context these skills also need to evolve and change.

Utilising a dynamic collaborative approach, our Critical Needs Analysis determines the key competencies needed by current and future architects, which facilitates new strategies to embed these qualities in our curricula. We have engaged with stakeholders across industry, public sector and community project partners to identify key skills gaps to incorporate into architecture curricula in order to deliver graduates with the required capabilities.

While the primary vehicle for testing curricula change is the Architectural Design Studio, our approach encompasses all areas of the curriculum, and is informed by the unique regional contexts, culture and values of each school of architecture. From Atlantic-facing rural environments, special landscape designations, just transitions, farming, forestry, tourism, shrinking and expanding rural settlements, through to larger urban settlements and towns with significant building stock and heritage in need of creative adaptive re-use, all have influenced the approach to curricular change.



Additionally, we are working closely with the RIAI as the Statutory Accreditation Body and a key project partner to contribute to the revision of the National Education Policy and Standard of Knowledge Skill and Competence for Architecture. Building Change and the RIAI's work in relation to architectural education is carefully aligned and mutually beneficial.

A further output is the Building Change CPD programme, which plays a central role through the upskilling of architecture educators, graduates, practising architects and members of allied professions. It comprises modules in Whole Life Design (TU Dublin), Biodiversity and Nature Conservation (TU Dublin), 'Research. Reuse. Housing' (UCD), Reviving Buildings (CCAIE), Digital Studios in a Zero Carbon Future (ATU), LOCAL-GLOBAL (UL) and Landscape and the Natural Environment in Architecture (SETU).

Most Innovative Achievement

Our work on Building Change encompasses a number of innovative achievements. Notable in itself is the coming together of all six schools of architecture towards a common purpose, the national endeavour that is Building Change. A further achievement is the level of engagement with community, with enterprise, with local government, and all our stakeholders, which enriches the architecture education we provide, in addition to informing the Building Change critical needs analysis. Our partnership with the RIAI deserves particular focus, where, informed by the work on Building Change, we have worked together towards the revision of the Architecture Education Standards.

However, if one innovative achievement must be identified, it is the significant role of the student voice in Building Change. We have worked in a synergistic manner with our students towards curricular change: through studio pilots; with students acting as curators and ambassadors; and in the 2022 and 2023 Student Symposia held to understand the student experience of our project. Furthermore, in October 2024 architecture students from across Ireland gathered in the RDS, in conjunction with the RIAI annual conference, to interact with their peers, and with enterprise, as they exhibited the groundbreaking work they have undertaken through Building Change.

CIRDAS

Centre for Insurance, Insurance, Risk and Data Analytics Studies

Lead Institution South East Technological University

Partner Institutions Atlantic Technological University

Project Summary

The Centre for Insurance, Risk and Data Analytics Studies (CIRDAS) was created by South East Technological University (SETU), Carlow Lifelong Learning (LLL), Insurtech Network Centre (INC) and our Higher education institute (HEI) partner in Atlantic Technology University Letterkenny (ATU). We are funded by the Higher Education Authority (HEA) and our aim is to become an education partner for the insurance/financial services sector providing bespoke, subsidised and accredited programmes from masterclass through to Level 9 major awards.

Project Objectives

The insurance sector (from broker to multinational insurer) is witnessing dramatic change with numerous challenges and opportunities on the horizon including; Brexit, low Interest rates, a challenging claims environment, increased competition and increased regulatory burden and oversight, increased automation and use of artificial intelligence. More recently, the Covid-19 outbreak has focused attention on the need for new approaches to underwriting, delivery, customer service and indeed employee upskilling. 47% of CEOs from the insurance sector indicated that training / upskilling was the most important initiative to close a skills gap. However, most companies in the insurance sector are not confident in their current capability in this respect with just 12% of respondents scoring their upskilling programme overall as 'very effective'. We established the Centre for Insurance, Risk & Data Analytics Studies (CIRDAS) to address these skill needs and to work with stakeholders across the sector.

Project Outputs

This project 'encompasses learner centred design and evidence of engagement with these learner cohorts' and co-creates programmes with industry partners through deep engagement with our collaborative and industry stakeholders. The central objective was to deliver granular transversal programmes with multiple entry/exit points under the four broad discipline pillars specifically Business, Data Science, Equality,



Diversity and Inclusion and Design Thinking. This project 'aligns in an innovative and or agile manner with the HCI objectives addressing two of the Key System Objectives for the Higher Education System 2018-2020' as the project will firstly provide a quality learning environment by delivering flexible programmes from masterclasses, to micro-credential 5 ECTS and 10 ECTS certificates to a full level 8 higher diploma and level 9 master's programme. To date on the project over 8,454 participants have attended masterclass events. Over 1,000 learners have completed accredited masterclasses. In November, 2024, 18 women who participated in our Master of Business in Executive Leadership programme will attend their conferring ceremony.



Most Innovative Achievement

Our strong engagement throughout the course of the project has allowed us to adapt our approach to the needs of industry. We have collaborated with various stakeholders to deliver bespoke topics as part of our masterclass series and the success of this approach can be seen in the strong numbers that have been delivered by our series of topics. We have created an environment where we have utilised the subject matter experts within SETU have been able to deliver relevant content to the sector in bite-sized learning

opportunities. We have collaborated with employers across the insurance and financial services sector resulting in over 1,000 learners registering to complete SETU programmes. We expect this number to grow to 1,500 learners by the end of 2024. By working closely with our Teaching and Learning Unit we have strengthened our approach to online learning and utilised a unique approach to RPL to give our learners access to cutting edge programmes of study designed with flexibility for part time learners and underpinned by academic rigor.

Convene – Transforming University-Enterprise Engagement

Lead Institution Technological University Dublin

Partner Institutions University College Dublin

Project Summary

Through Convene, the TU Dublin Enterprise Academy and UCD Innovation Academy are supporting collaboration and co-creation with enterprise across the talent development pipeline. Dedicated teams at Ireland's two largest universities are exploring new ways that universities and enterprise can work together to meet priority and emerging skills needs while creating new and effective access and progression pathways to higher education for workforce upskilling.

As brokers across the university/enterprise ecosystem, we focus on understanding and responding to the real-time needs of enterprise to co-create accredited, cross-disciplinary educational solutions. We incorporate emerging technological, educational and entrepreneurial innovations into our programmes for learners at all stages of the talent development pipeline, from undergraduates to workforce learners.

Our work has resulted in new accredited programmes in priority skills areas including AI, sustainability and technology; academic and partnerships providing Irish enterprise with innovative, agile learning solutions; and award-winning innovations in teaching and delivery.

Project Objectives

Convene is a co-learning partnership between the TU Dublin Enterprise Academy and UCD Innovation Academy. First-of-their kind, discipline-neutral units within Ireland's two largest universities, both Academies span enterprise, academia, and innovation. They adopt a responsive, agile approach to talent development and cross-disciplinary provision, working in partnership with enterprise.

Our aim is to transform the enterprise engagement ecosystem by taking a future-focussed approach to collaborative talent development. Programmes are designed with enterprise and for enterprise; the Academies bring enterprise into the classroom, and the classroom to enterprise.

TU Dublin Enterprise Academy and UCD Innovation Academy, through Convene, seek to:

- Demonstrate new ways that academia and enterprise can work together to meet priority and emerging skills needs
- Pilot scalable models of collaboration and co-creation with enterprise across the talent development pipeline;
- Design and deliver new programmes equipping learners with in-demand skills and future-proofing Ireland's economy;
- Innovate new, dynamic methods of teaching and delivery so that learners benefit from more engaging ways of learning on enterprise-focused courses;
- Share our learnings as an exemplar of university-enterprise engagement that can be adopted across the Irish higher education system.

Project Outputs

Convene was pivotal to the establishment of the Enterprise Academy at TU Dublin, a dedicated unit to broker cross-disciplinary partnerships between enterprise, faculties and professional services. These partnerships have resulted in the development of:

- A Postgraduate Diploma in Sports Analytics, Technology and Innovation with Technology Ireland Digital Skillnet and the SportsTech Ireland industry cluster.
- A customised programme in 3D Modelling and Design and Applied Interactive 3D Games Technologies for Intel.
- A Certificate in Applied Procurement Management for BT Sourced.
- Multi-annual Certificate in Leadership for Version 1.



- Multi-annual Certificate in Strategic Talent Development Planning in conjunction with Skillnet Ireland and the IDA.
- A Postgraduate Certificate in Medical Device Regulation with SGS.
- A suite of programmes and pathways into and through the screen industry in collaboration with Screen Ireland and TU Dublin's School of Media including the BA in Screen Industry Practice, Certificate in Portfolio Preparation for the Screen Industry and Passport to Production.
- The project's first major collaboration, the co-design and launch of the UCD-TU Dublin joint Professional Diploma in Transversal Skills, was launched in 2020 as a response to unemployment, particularly in the hospitality and tourism sectors, caused by the pandemic. When launched there were 1,105 expressions of interest for 100 places.
- Convene has awarded 16 Fellowships at TU Dublin resulting in the development of a range of offerings including; stackable Postgraduate Programmes in Brewing and Distilling and Inclusive third level Education for people with an intellectual disability.
- Incorporation of challenge-based pedagogy across TU Dublin and UCD brings together enterprise and students from different disciplines to work on industry challenges.
- Convene launched new enterprise-centred UCD undergraduate modules, lifelong learner programmes in sustainability, digital transformation and innovation and ai, and technological innovations through virtual reality and creative technologies in UCD's Living Labs.



Most Innovative Achievement

TU Dublin Enterprise Academy and UCD Innovation Academy are first-of-their-kind, discipline-neutral units within Ireland's two largest universities, with missions that encompass enterprise, academia and innovation.

The key innovative achievement was the development of the Postgraduate Diploma in Sports Analytics, Technology and Innovation, the result of a strategic collaboration between Technology Ireland Digital Skillnet, SportsTech Ireland, and TU Dublin's Enterprise Academy. This partnership has been critical to developing a talent strategy for the sportstech industry.

The programme is Ireland's first postgraduate course designed for industry professionals seeking expertise

on the business of sports. Developed in response to the needs of the sportstech industry in Ireland, driven by digital advances and growing demand to extract business value from sports data.

The programme equips learners with knowledge and skills for the key challenges facing the sports industry; Digital Transformation; Sports Data for Performance & Innovation and Effectively Harnessing Sports Technology. In 2025, a Masters track will build on this innovation by developing deeper competency in Applied Analytics, Critical Thinking & Decision Making and Leadership for High Performance.

In parallel, UCD Innovation Academy's own Postgraduate Diploma in Innovation for Sustainability, provides in-work learners with upskilling in one of our economy's most in-demand sectors.

“The HCI Pillar 3 projects have delivered transformative innovations in higher education skills delivery through micro-credentials, transversal skills, challenge based learning and technology innovations from cyberskills to sustainability all in collaboration with enterprise. It has been central in helping Ireland to achieve the innovation and agility necessary to respond to the rapidly evolving skills and labour market landscape of the 21st century.”

Dr Kevin Marshall
Chair of the National Skills Council

Creative Futures Academy

Lead Institution National College of Art and Design

Partner Institutions University College Dublin, Dún Laoghaire Institute of Art, Design and Technology

Project Summary

Creative Futures Academy (CFA) is a collaborative partnership, funded through the Human Capital Initiative, between the National College of Art and Design (NCAD), University College Dublin (UCD) and the Institute of Art, Design and Technology (IADT), Dún Laoghaire. CFA is a new approach to higher education that sees academics across the institutions work in collaboration with industry experts to identify future skills needs across the creative and cultural sector, creating learner-centred programmes that respond to these in a meaningful way. Courses available under the CFA partnership include screenwriting; film, media and broadcasting; creative and cultural management, digital making, service design; new technologies, such as AI and XR, strategic and user-centred design and sustainable ecological and circular creative practices. They span short continuous professional development (CPD) options, postgraduate certificates, bachelor's and master's degrees offered at level 8 and 9. Together with industry we are changing how learners access skills, resources, networks and expertise.

Project Objectives

Creative Futures Academy is extending the reach of higher education through the development of flexible learning platforms that allow working professionals, the creative sector, mid-career professionals and anyone interested in life-long learning to engage. Our mission is to anticipate and respond to creative practitioners, creative industries and wider enterprise learning needs using design led and creative approaches. We promote inter-institutional collaboration across academic and management teams as a way of enriching the learning experience and knowledge transfer. We continue to innovate our pedagogical, accreditation and assessment models to align with learner and work based needs in order to deliver responsive, relevant and future focused skills in an ever changing environment.

Thought leadership and demonstrating the value of creative arts education and the creative and cultural sector is core. We demonstrate the power of creative methodologies as a learning process that can be applied in any sector. We are working towards a model of greater self-directed learning through the rollout of micro-credentials with systems to support stackable credentials and learner mobility.

Project Outputs

Creative Futures Academy has affected far-reaching innovation, leading to ground-breaking changes across multiple systems in NCAD, IADT and UCD.

This includes:

- Dynamic and effective inter and intra institutional collaboration at all levels.
- The development of new and shared pedagogical frameworks that: enables the delivery of micro-credited certificates, diplomas, bachelor's and master's degrees; presents the potential for a fundamental change in the structure of new BA and MA provision and significantly enhances higher education institutions' ability to respond to current and future skills needs.
- A shared attributes framework now supports educators and students in the development of new programmes and enhances the learning experience.
- Enhanced collaboration with the creative and cultural industries has brought real world experience to learners and deepened understanding of industry needs and HE operating environments. This is underpinned by the rollout of 100+ courses, a strong CFA brand and increasing interest in partnership with CFA across CCIs and wider industry.



HCI funding has allowed a level of risk-taking, research and experimentation which has resulted in cross-collaborative programmes that are attracting new types of learners from diverse fields, which continues to enhance the overall learner experience. State of the art facilities have been developed across all partners including: 'Trapdoor' a 145 seater performance and events space with a 'Creative Arts Research Lab' at UCD; the Walsh digital prototyping Lab at NCAD and the Atmos Dolby Studio and Immersive Labs at IADT.

Most Innovative Achievement

CFA has developed a multi-platform framework of courses and other forms of learning across three HEI's, in partnership with industry.

At NCAD a new level 9 programme architecture offers a range of stackable modules and exit awards to reflect diverse learner needs across a range of creative disciplines. The architecture relies on a new suite of over 40 module 'vessels' offered in numerous delivery modes – intensive, immersive, hybrid, online etc.

CFA funding has facilitated strategic institutional transformation at IADT through the implementation of new policies and practices, including a micro-credentials framework, streamlined validation procedures, and enhanced staff and student mobility. Expanded programme offerings in the creative industries, informed by industry consultations, have provided greater flexibility for transversal learning. Investments in creative technologies and the development of signature pedagogies are further supported by the development of a level 9 Certificate in T&L for the Creative Arts.

At UCD, CFA has introduced practice-based learning and creative assessment to enhance the established research culture. Our new programmes (BA Creative & Cultural Industries and MA Writing for Stage & Screen) have spearheaded this step change. Our cutting-edge Black Box teaching space and media lab have embedded these new approaches, considerably broadening student ambition and experience.

Cyber Skills

Lead Institution Munster Technological University

Partner Institutions Technological University Dublin,
University College Dublin, University of Limerick

Project Summary

Cyber Skills is a collaboration between MTU, TU Dublin, and UL. It provides online, flexible, university accredited micro-credentials and job role specific pathways to enable professionals to upskill and re skill in cyber security, addressing the critical skills shortage in cyber security.

This initiative provides the flexibility to respond to the needs of the economy by designing courses with industry partners to equip students with the skills and knowledge required to thrive in what is a challenging and critical area for every business.

A key aspect of the project is its investment in a national cyber-range infrastructure to:

- Advance cyber security research
- Foster collaboration and innovation
- Enhance digital security infrastructure across key sectors in Ireland and Europe
- Enable Cyber Skills to get the community involved in cyber awareness activities
- Cyber Skills is committed to positioning Ireland at the forefront of international cyber security efforts to become the next global cyber security ecosystem.

Project Objectives

Cyber Skills multifaceted approach to addressing cyber security skill shortages includes:

1. Updating and refining educational curriculums to include the latest cyber security trends and skills.
2. Implementing accessible upskilling programmes for current professionals to keep pace with the rapidly evolving cyber security landscape.
3. Broadening the cyber security workforce by reaching out to untapped talent pools, including career changers and individuals from diverse backgrounds.
4. Running public awareness campaigns to highlight the importance and potential of careers in cyber security, aiming to attract more individuals to the field.
5. Collaborating with government and private sector entities to align effort and maximise resources.
6. Engaging in international partnerships and exchanges to adopt best practices and global standards in cyber security education and training, i.e. Cyber Skills partnership with the Commonwealth Cyber Initiative (CCI) at Virginia Tech, a global centre of excellence in security, to build on international experience in solving the global skills shortages.

Project Outputs

- 10 co-designed courses and 28 micro-credentials, fully accredited and online.
- 352 students enrolled.
- 939 industry engagements.
- 302 publications.
- 60 student & industry mentoring opportunities.
- Member of 29 industry, advisory and expert groups.
- 414 promotional activities.
- 50 new SMEs joined Cyber Ireland in 2022 and 2023.
- 8 Government collaborations.
- Over 2,000 secondary school students reached through SFI Discover Cyber Futures Escape Room activity.
- 310 participants in cyber awareness activities to enhance cyber security literacy among citizens.
- 3 new members of CONNECT, Science Foundation Ireland Research Centre for Future Networks and Communications.
- Awarded three SFI National Challenge Fund projects - Cyber Shock, Cyber Safety, and Cyber Resilience for SMEs.
- Development of new national services including the ENTIRE Digital Innovation Hub (DIH), a penetration toolkit, and identification of vulnerabilities and SDN Environment.
- HEIs collaborate and share knowledge to establish a Community of Practice (CoP), joint parchments, research collaborations and staff training.
- The procurement and setup of the first of its kind in higher education in Ireland, the Cyber Range cloud and mobile unit.
- MTU hosts the national quantum cloud computing trusted research environment jointly funded by EU OCRE funding and supported by Rackspace Technologies and AWS. The QCloud project enables free, scalable access to quantum computing infrastructure for researchers across Ireland.
- Embracing equality, diversity and inclusion,
 - ♦ The Cyber Security Academy has achieved 25% female participation in a domain where only 10% of the global workforce is female and 20% participation from DEIS schools.
 - ♦ Our partnership with SafeIreland highlighted the dangers of technology-facilitated abuse through the #RedFlagsAreAbuse campaign.
 - ♦ The Science Image depicted the lived experience of Technology Enabled Coercive Control.
- HEIs have deepened EU/international partnerships on the topic of cybersecurity through:
 - ♦ The ESCO Cyber Range features and checklist
 - ♦ ESCO Cyber Range Scenario development
 - ♦ US-Ireland-Northern Ireland Event
 - ♦ Ongoing partnerships with Virginia Tech and Rochester Institute of Technology (RIT)



Most Innovative Achievement

Innovative Education Approach

1. Flexible Learning Paths.
2. Work-Based Learning made possible on the Cyber Range.
3. Continuous Professional Development and Focus on Lifelong Learning.

Cyber Range

The Cyber Range enables the delivery and development of advanced cybersecurity skills for academic/work-based learners to hone their skills and experience real-world breaches/scenarios in a highly realistic training environment using similar equipment and tools to what they would have on the job.

It also supports several Cyber Skills initiatives, such as:

1. Cyber Futures Cyber Security Academy for secondary school students aged 16-18.
2. Cyber Futures and Smart EDU Club's on-line Cyber Security Workshop for primary school students aged 8-12.
3. The WorldSkills Ireland Team Cybersecurity has had great success at International WorldSkills events, including:
 - ♦ Winning gold at the WorldSkills Global Skills Challenge 2024 in Australia.
 - ♦ Representing Ireland in Lyon, France at WorldSkills International 2024 and in Goyang, Korea at the 2022 Special Edition.
 - ♦ Cyber Skills researcher Dean Brennan won the HEA silver medal at the WorldSkills Ireland Cyber Security Competition 2023 and was part of the team that represented Ireland at the 2022 Special Edition.
4. Strengthening Industry Engagement by identifying and flagging vulnerabilities across a variety of sectors.

“In fields spanning areas such as RPL, micro-credentialing, and transversal skills, we are seeing transformative system level innovations being introduced into the higher education system that are already affecting tens of thousands of learners, on over 1000 new courses, and generated over 70,000 HEI engagements with companies. These system improvements, and other transformations in areas such as creativity, sustainability and additive manufacturing will continue to reverberate beyond the lifetime of the projects.”

Dr Vivienne Patterson

Head of Skills Engagement and Statistics

DASBE

Digital Academy for the Sustainable Built Environment

Lead Institution Technological University of the Shannon

Partner Institutions Atlantic Technological University, Tipperary Energy Agency, Irish Green Building Council

Project Summary

The Digital Academy for the Sustainable Built Environment (DASBE) emerged from the need to address critical skills gaps in the construction sector which are driven by increasing demands for sustainability and digital transformation. DASBE provides flexible, and accessible education designed to equip the sector with the knowledge and skills required to meet evolving market and policy challenges.

The DASBE digital platform has been developed as a centralised hub to address the skills gap. It enables learners to select programmes, actively engage with educational content and resources, and define their career pathway.

DASBE has collaborated with industry experts to develop digital twins and virtual reality tools to enhance traditional educational resources, providing more immersive and interactive learning opportunities.

Following extensive industry engagement, 68 new programmes have been designed on a range of topics from energy retrofitting of buildings to the application of BIM (Building Information Modelling) and drones in building surveying.

Project Objectives

The project aimed to establish an online national digital platform dedicated to offering upskilling, capacity building, and educational resources to the construction sector, in an accessible and flexible learning centric environment. An initial target for the platform was to host 20 online and blended programmes across the themes of energy efficiency, circular economy and digital construction. By 2025, this figure will grow to over 40 programmes and engage a minimum of 2,000 learners. Further objectives included:

To create a programme design, development and deployment model which will enable rapid response to policy and industry needs through horizon scanning processes.

To create upskilling opportunities that are flexible, accessible and responsive to the ever-changing needs of the construction sector and address skills gaps focussing on three key learning areas: energy efficiency, circular economy, and digital construction.

To create virtual reality educational tools to provide immersive hands-on learning experiences, and create digital twins across partner campuses where staff, students and estates can access simulations and real-world energy performance data.

To connect past, current and future R&D with education and training activities to ensure that learners are exposed to leading expertise, knowledge and data.

To collaborate with industry stakeholders on programme design.

Project Outputs

DASBE Platform

The bespoke DASBE digital platform has been designed as a centralised hub to address the skills gap in the construction sector. Learners can actively engage with educational content and resources and define their career paths for the future. Key learnings from the development of the DASBE platform include the importance of adaptability in digital design and the value of creating a centralised, non-duplicated catalogue of programmes. This approach has reduced costs, increased student intake, and enabled better alignment of education offerings with industry needs.

Programme Development

68 new programmes have been delivered in response to the needs of the construction sector. These include 28 micro-credentials, 33 special purpose awards and 7 major awards spanning levels 6 to 9 on the NFQ. An additional 22 programmes are being developed for launch in January 2025.

As of September 2024, DASBE supported 1,361 learners to enrol across various programmes.

Digital Tools

Collaboration with industry experts to develop digital twins of both ATU and TUS campus locations. These digital twins will act as education tools, accessible to both staff and students as well as being valuable tools for university estates teams to support increased efficiency of asset/resource management, delivery of decarbonisation targets and building future proofing.

Development of three immersive virtual reality and mixed reality solutions to support learning in the field of sustainability in the built environment, defects detection in traditional buildings, heat pump & photovoltaic installation and building fabric design.

Industry Engagement

DASBE has been represented at 128 industry and education events, conferences, exhibitions, expert panels and webinars. The DASBE Transforming Construction Skills Conference in May 2024, gathered 100 industry professionals, educators, representatives from professional organizations, and researchers to explore upskilling opportunities for construction professionals and to examine the latest trends and emerging technologies.



Most Innovative Achievement

Since 2021, DASBE's Virtual Reality team has explored immersive training solutions, with the latest projects showcasing DASBE's most innovative work. These virtual and mixed reality experiences expand upon traditional educational resources, offering more engaging, hands-on learning experiences.

DASBE has piloted these solutions at industry workshops and partner universities, offering valuable opportunities to gather feedback and insights that have been incorporated into the design process.

Defects in Traditional Buildings

This VR solution allows users to explore an aged, potentially hazardous cottage to identify defects. Unlike costly, time-consuming, and risky real-world visits, this virtual platform offers a safe and time efficient alternative. It also includes experimental interactive training scenarios, such as a dynamic quiz and an interactable wall diagram.

Heat Pump & Photovoltaic (PV)

This application provides an immersive platform for exploring sustainable energy. Set within the TUS Thurles Campus, users can interact with a virtual heat pump and PV panel, exploring components, functionality and installation requirements and standards.

Building Fabric Design Tool

This tool helps users optimise the thermal performance of various wall types. Using mixed reality, it overlays 3D models of wall configurations onto the real world, allowing real-time material adjustments and instant U-value calculations for energy efficiency.

DCU Futures

Reimagining Undergraduate Education for an Unscripted World

Project Summary

DCU Futures marks Dublin City University's most ambitious teaching and learning innovation to date. Backed by a Human Capital Initiative investment, this groundbreaking project reimagines undergraduate education, preparing students for an "unscripted future" shaped by rapid technological and social change.

By 2025, DCU Futures will welcome over 1,000 additional students, offering a transformed educational experience that bridges classroom learning with industry engagement. The project embeds digital literacies, disciplinary expertise, and crucial transversal skills, empowering graduates to thrive in their lives and careers.

DCU Futures is reshaping higher education by using innovative pedagogies, advanced technology integration, and collaboration with enterprise partners from key economic sectors. Aligned with DCU's strategic pillar of pioneering a transformative student experience, the project fosters genuine, life-changing growth for our students, preparing them to become transformative forces in society, and tackle the challenges of tomorrow as graduates.

Project Objectives

The objectives of DCU Futures are to:

- Prepare students to thrive in an increasingly unscripted and complex world
- Adopt innovative pedagogical methods
- Embrace DCU's value system by seeking to transform lives and society.

DCU Futures is built around three pillars:

1. Evolving what students learn: We ensure that graduates are equipped to address skills gaps in the workforce. Since 2021, DCU Futures has launched ten new undergraduate degree courses / specialisms, informed by our

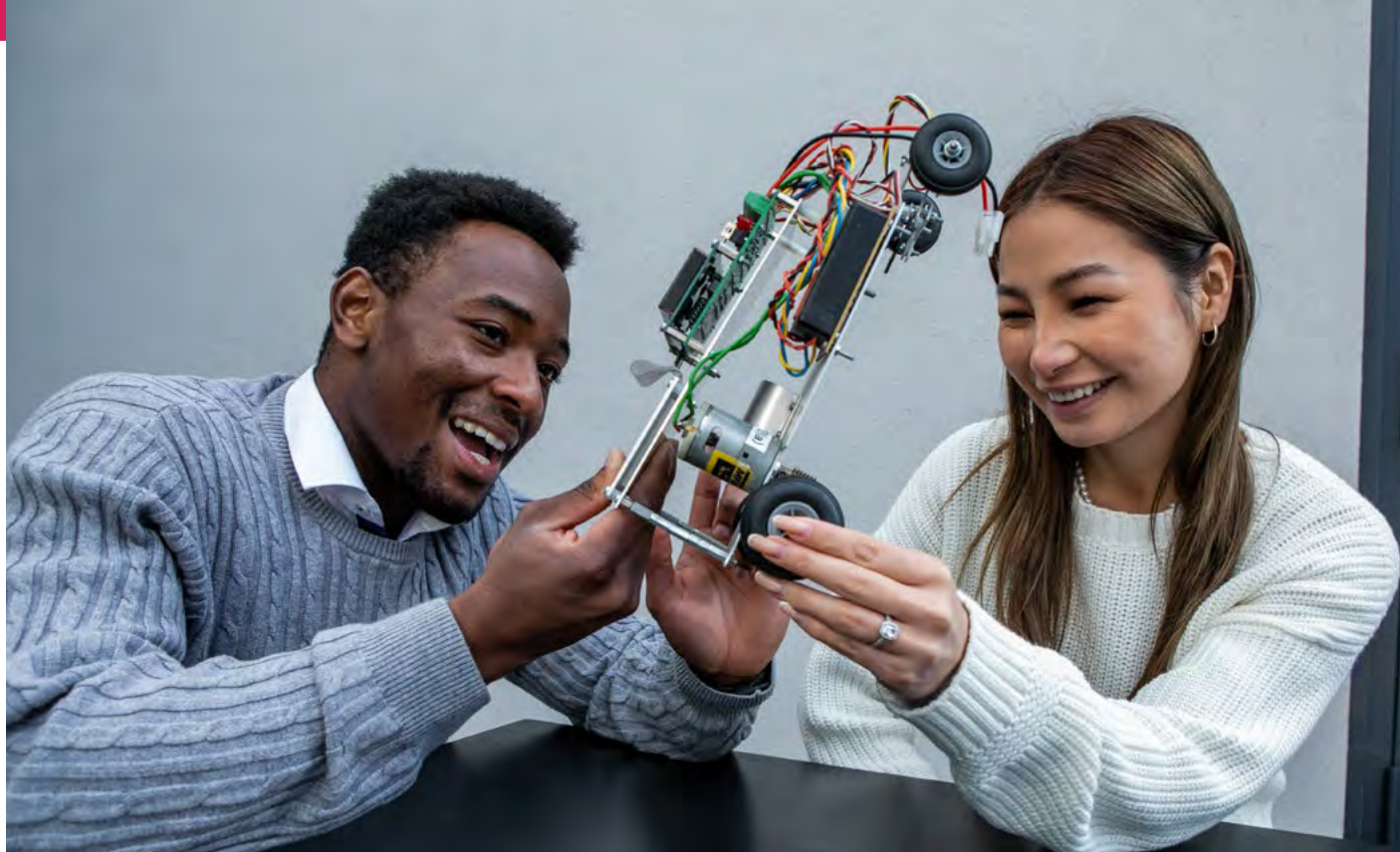
enterprise partners and aligned with national strategies such as Future Jobs Ireland 2019 and the National Skills Strategy 2025.

2. Transforming how students learn: DCU Futures represents an investment in innovative pedagogies, including challenge-based learning (CBL), industry engagement, immersive learning experiences, online learning, and virtual laboratories, providing invaluable real-world insights and connections.
3. Embedding and evidencing the Transversal Skills to thrive: DCU Futures champions transversal skills, essential to graduate success. DCU Futures has developed a unique Transversal Skills Competence Framework through unprecedented collaboration with internal and external partners, ensuring these skills are rigorously integrated and transparently evidenced across courses. All students engage in an innovative module on Data Literacy and Analytics and have the opportunity to study seven languages at varying levels.

Project Outputs

By 2025, these future-focused courses will accommodate over 1,000 additional students, significantly expanding DCU's capacity to meet educational demands.

A unique Transversal Skills Competence Framework has been developed, prioritising 17 key transferable skills like communicative competence, critical thinking, and digital literacy. These skills are integrated across 14 courses and almost 100 modules. A custom-made platform allows students to track their skill development through both curricular activities and self-reporting. This initiative prepares graduates for diverse career paths and evolving job markets.



DCU Futures has invested in innovative teaching methods, including Challenge-Based learning which has engaged 1,600+ students in 34 real-world challenges. 15% of modules are also delivered online, and virtual learning has been integrated into almost 20 modules, incorporating inquiry-based learning, gamification, and the flipped classroom. These methods engage students with real-world challenges and industry-relevant experiences.

We have collaborated with external partners from key sectors of Ireland's economy and society, leveraging their expertise to shape our curricula and enrich student experience through guest lectures, field trips, challenge-based learning, mentoring, and internship opportunities.

Futures offers students opportunities to develop multilingualism and intercultural competence. To date, over 600 students have registered for courses in seven languages (French, Spanish, German, Japanese, Chinese, Russian and Arabic).

By 2025, over 250 academic and professional service staff will be actively involved in DCU Futures. Robust governance structures ensure effective project delivery and continuous improvement, such as our external industry advisory board and international academic advisory group. Our strategic learning groups ensure cross-disciplinary capacity building of our key internal stakeholders, such as students through the Student Summit, and colleagues from across the university via the Virtual Labs and Challenge-based Learning working groups.

Most Innovative Achievement

DCU Futures' principal achievement lies in its revolutionary approach to pedagogy, developed hand-in-hand with industry partners. At the heart of this innovation are two groundbreaking initiatives: the Transversal Skills Competence Framework and Challenge-Based Learning.

The Transversal Skills Competence Framework focuses on 17 key transversal skills. These skills are embedded into 14 courses, supported by a bespoke platform enabling students to track their skill development through curricular activities and self-reporting. Crucially, students will be able to generate a fully personalised DCU-endorsed transversal skills profile, which can be shared with potential employers.

Complementing this, Challenge-Based Learning engages students in real-world scenarios, bridging the gap between academia and industry. By tackling authentic problems set by our enterprise partners, and being mentored by these partners, students hone their collaborative, problem-solving and communication skills, gaining invaluable practical experience.

This dual approach, combining essential skill development with hands-on, industry-relevant learning, positions DCU Futures at the vanguard of educational innovation. By equipping students with both the skills and real-world experience demanded of the modern workforce, DCU Futures ensures its graduates are not just prepared for their careers, but are poised to lead and innovate in an ever-evolving society.

Designing Futures

Project Summary

Designing Futures is a transformative initiative at the University of Galway that equips students with the skills needed to navigate a fast-changing world. By emphasising innovation, education, mentorship, and coaching, it transforms the student experience into one that is dynamic, industry-connected, and future-focused.

A key aspect is bridging academia and enterprise, ensuring students gain academic knowledge while engaging with real-world challenges. This approach fosters critical thinking and creativity, preparing students for successful careers and meaningful contributions to society.

Strong industry and community partnerships enable co-designed learning experiences that align with evolving workforce needs. These collaborations ensure students are well-prepared to meet modern demands and make an impact in their fields.

Designing Futures also focuses on the holistic development of students, providing opportunities for their growth inside and outside the classroom. This comprehensive approach enhances employability and equips students to lead impactful lives in a rapidly evolving, challenging and complex world.

Project Objectives

At the heart of Designing Futures is a commitment to empowering students with the educational experiences necessary to thrive in an evolving world. Central to this mission is a strong focus on skills development, aligned with national educational policy, skills strategy and enterprise needs:

- IdeasLab is a dynamic space where students tackle real-world challenges while collaborating with industry partners. Through design-centric activities and enterprise-specific programming, students hone their creative, innovative, and entrepreneurial skills. This hands-on approach fosters empathic understanding and strengthens their connections with industry.

- Student Success Coaching provides tailored guidance to help students design their academic, personal, and professional pathways, empowering them to achieve their goals during university and beyond. This is underpinned by a first-for-credit Life Design module in an Irish university.
- Our Transdisciplinary Modules equip students with professional skills, blending academic expertise and input from enterprise partners. These modules allow students to develop critical thinking, problem-solving, and collaboration skills.
- University Skills Passport (USP) recognises students' achievements across curricular, co-curricular, and extracurricular activities, showcasing their personalised skills development.
- Vertically Integrated Projects (VIPs) enable students to work with faculty on multidisciplinary research projects, addressing grand societal challenges. This strengthens their research abilities and increases engagement across the university.

Project Outputs

Designing Futures has established strong and sustainable partnerships with key industry stakeholders, resulting in collaborative projects and co-designed learning experiences. These partnerships prioritise skills development across both curricular and co-curricular activities, ensuring students are well-prepared for the modern workforce. Designing Futures has facilitated faculty to innovate their teaching.

Through IdeasLab, over 1,000 students engage annually with more than 50 enterprises, fostering an environment that emphasises problem-solving, innovation, and empathy. This initiative empowers students to launch innovative ideas and startups, bridging the gap between academia and industry by providing hands-on experience and direct industry engagement.



Participation in Vertically Integrated Projects (VIPs) has increased significantly, involving more students and faculty in multidisciplinary research, developing new research initiatives for students across various fields.

The Empathy Studio supports students in creating empathy-driven, human-centred design solutions, co-developed with industry and community partners. These solutions address societal challenges in health-care, technology, and education, enhancing the role of empathy in innovation.

The University Skills Passport (USP) is a groundbreaking digital credential, powered by a fully configurable SaaS IT application, allowing higher education institutions to recognize and publish skills development opportunities. Upon graduation, students will receive their degree parchment, academic transcript, and USP, showcasing their achievements across academic and co-curricular activities.

Tailored Student Success Coaching has led to measurable improvements in student satisfaction, academic performance, and confidence in life design and career planning.

Transdisciplinary learning modules have been developed, incorporating enterprise and innovation, and are available across multiple academic programs, promoting collaboration and interdisciplinary learning.

Research and case studies from Designing Futures have been peer-reviewed and published internationally, contributing to both academic knowledge and industry best practices.

Graduates of the initiative demonstrate increased employability and a strong sense of belonging, equipped with critical, creative, and entrepreneurial skills, as reflected by improved post-graduation employment rates and positive employer feedback.

Most Innovative Achievement

IdeasLab's Empathy Studio, winner of Galway Chamber Award for Innovation 2023

The Empathy Studio is revolutionising education with its empathy-driven design approach. In 2023, it launched the "Empathy in Action" module, enabling students to apply empathy in real-world contexts by collaborating with diverse communities. In 2025, this will expand with a new module in the College of Medicine, Nursing, and Health Sciences.

University Skills Passport (USP)

The University Skills Passport (USP) is a new innovation in digital credentialing, addressing the need for higher education to emphasize key skills for student success. This SaaS-supported platform allows institutions to prioritize employer-valued skills across both curricular and co-curricular activities. This innovation places University of Galway at the forefront of skill development in Ireland's higher education landscape.

International Recognition for Peer-Reviewed Published Research

The paper "Designing Futures Through Student Engagement" was published in the esteemed Policy Futures in Education journal. At the HEAd '24 International Conference, the paper "(Re-)Discovering the Treasure Within: The Contribution of a Design Your Life Module to Undergraduate Education" received the Best Paper Award from over 288 submissions from 56 different countries. These accolades underscore Designing Futures' significant contributions to academic discourse, highlighting its impact on global higher education practices.

Enabling Future Pharma

Beyond the Pill

Lead Institution RCSI, University of Medicine and Life Sciences

Project Summary

RCSI-University of Medicine and Health Sciences has reimagined university science education. Enabling Future Pharma has developed two new innovative degree programmes: BSc Advanced Therapeutic Technologies and MSc Technologies and Analytics in Precision Medicine. These programmes have been co-created with biopharma industry stakeholders. These industry informed curricula ensure students acquire the in-depth scientific knowledge and skills that resonate with the global pharma industry – computational biology, genetics and genomics, regulatory affairs, biostatistics, bio-manufacturing, data analytics and AI & machine learning, digital and connected health. Industry experts contribute to programmatic delivery providing industry context and expertise.

Beyond the core science subjects - each curriculum has a deliberate emphasis on the development of transversal skills, competencies highly valued by industry, in leadership, management, enterprise, collaboration and communication, enhancing graduate career readiness. Moreover, through micro-credentials, the project has provided flexible pathways to prospective learners to develop specialist scientific skills, enhancing employability within the Irish pharma sector.

Project Objectives

The healthcare sector is undergoing a paradigm shift, incorporating data science, omics and AI to create a future of connected healthcare – fusing digital technology with traditional science. Disruption to the existing model, coupled with increasing demand for healthcare access, has led to an increased focus on prevention and tailored therapies. Central to making this a reality is an educated workforce which can deliver these needs through multi-disciplinary and collaborative approaches.

Enabling Future Pharma seeks to co-create, with industry partners, innovative university programmes at NFQ levels 8 and 9, complimented by micro-credentials, which equip graduates with technical, transversal and business skills to embrace the fourth industrial revolution in health and healthcare. The objective is to provide a skilled workforce to meet current and future societal and pharma enterprise needs by developing:

- 1) BSc in Advanced Therapeutic Technologies which equips graduates with future focussed scientific technical competencies, power skills and an understanding of the global pharma ecosystem, from bench to bedside;
- 2) MSc in Technologies and Analytics in Precision Medicine which equips graduates with skills in precision medicine, data analytics & computational biology, connected healthcare, innovation & leadership.
- 3) Develop micro-credentials addressing specific pharma enterprise needs, delivered in a student centric manner.



Project Outputs

- Establishment of the Enabling Future Pharma External Advisory Board, meeting bi-annually, to advise on Curriculum design & Pharma landscape, nationally and internationally.
- Designed, developed and obtained NUI/RCSI regulatory approval for the MSc (Technologies & Analytics in Precision Medicine) in 2021. Enrolled first students in Q3 2021.
- Designed, developed and obtained NUI/RCSI regulatory approval for the BSc (Advanced Therapeutic Technologies) in 2022. Enrolled first students in Q3 2022.
- Designed, developed and obtained NUI/RCSI regulatory approval for a suite of level 9 micro-credentials:
 - Human Genetics and Genomics/Omics Technologies
 - Bioinformatics and Biostatistics
 - AI and machine learning in the healthcare setting
 - Leadership Development
 - Contemporary Issues in Healthcare
 - Digital and Connected Health
 - Innovation - Translating the Concept
- Designed, developed and implemented an innovative IT platform to support delivery of the MSc(TAPM) programme.
- Design and development of a Kaizen IT platform to enhance BSc(ATT) student experience, through provision of enhanced personalised feedback and real-time monitoring of student achievement.
- Designed, developed and launched an IT platform to support placement identification and allocation for Year 3 BSc(ATT) placements – first placements occurring January – August 2025
- Preparation and rollout of a strategic pharma industry engagement plan to drive pharma industry awareness of the BSc(ATT), MSc(TAPM), micro-credential offerings & BSc(ATT) placement /internship opportunities.
- Launched Takeda Ireland ATT Scholarship to widen access to the BSc(ATT) Programme
- Delivered specialist training in Bio-Manufacturing in Year 3 BSc(ATT) in conjunction with NIBRT.
- Preparation and successful rollout of a sustainable marketing and recruitment campaign to drive student programme awareness and learner recruitment in the Irish market.
- Strong growth in learner numbers achieved in both MSc(TAPM) and BSc(ATT)
- Participation at Irish education and career exhibitions – Higher Options, Grad Ireland, NIBRT Careers Fair, STEM Women
- Participation at Education in Ireland India roadshow and related activities (School/University Visits) to drive student recruitment internationally.



Most Innovative Achievement

It is imperative that learners are provided with university curricula which enable them to succeed in the modern era. The overarching aim of 'Enabling Future Pharma' is to develop a suite of innovative and agile programmes focused on emerging and future pharma technologies that create a skilled talent pool. These programmes address identified current and future skills gaps in the pharma industry and in so doing enable future jobs growth and societal benefit.

Working in partnership with industry, the Enabling Future Pharma project has succeeded in co-creating, with pharma Industry stakeholders, differentiated curricula which resonate strongly within the pharma ecosystem. Our innovative and inclusive approach to curricula design and delivery recognises that skillsets cannot be focused only on new technologies but must also consider new ways of working.

The programme curricula are deliberately built upon three pillars: (i) future focussed technological/scientific capabilities in precision medicine, bio-manufacturing, computational biology, connected & digital health complimented by (ii) the development of transversal skills in teamwork, communication, collaboration and leadership and (iii) business skills in enterprise and innovation. This innovative combination of skill sets in our graduates will drive creativity and flexibility in our national workforce, achieved through partnership with enterprise locally, nationally and internationally.



24
NUMBER OF
PROJECTS



11
INTERNATIONAL
PARTNERS



427
ENTERPRISE
PARTNERS



84
ACADEMIC
PARTNERS



34
NUMBER OF
DISCIPLINES
IMPACTED



Funds Academy

Strengthening and Protecting the Funds Industry in Ireland

Lead Institution South East
Technological University

Partner Institutions Munster
Technological University

Project Summary

The Funds Academy was established to promote executive education and development within the investment fund industry in the south-east and south-west regions. The project has led to industry/academic co-development of several programmes including an executive Masters in Investment Fund Administration, a Certificate in Regulated Investment Funds and several micro-credentials, reducing financial and geographical barriers for regional upskilling and development. We have organised several ancillary initiatives, including breakfast briefings, networking events and a podcast/seminar series, in collaboration with the companies in the investment fund administration sector. We have enhanced the skillset of the existing talent pool for this growing industry and increased awareness among undergraduates of opportunities in the sector. By feeding into national reports such as IFS and Funds 2030, as well as advocating for skill-needs in the sector we have influenced the national discourse on investment fund education and the development of the regional investment fund sector.

Project Objectives

In the original funding proposal, the activities of the Funds Academy were quite narrowly defined. Since then, and following the successful roll out of our master's programme, the impact of the Funds Academy has been much more widely conceived.

The aims of the Funds Academy are to:

- provide upskilling opportunities to those working in regional fund sector employers, to reduce entry barriers to career focussed programmes and to encourage career progression for all;
- help those deciding on their career choices by promoting the investment fund administration sector as a career option for undergraduates;
- provide entry-level upskilling opportunities to those who aspire to work in the investment fund administration sector;
- cultivate a strong regional knowledge-sharing network for those at all levels of their careers in the funds sector;
- impact the national discourse on investment fund education and to promote education and skill development as an essential enabler of the further expansion of the industry;
- develop institutional capabilities in financial services and investment fund administration education and programme delivery; and
- promote the regions as locations for new fund service providers to establish their operations.





Project Outputs

The main outputs from the Funds Academy project include:

- Masters in Investment Fund Administration – *We have just enrolled our fourth cohort onto our blended, part-time master’s programme. This programme is delivered concurrently by SETU and MTU.*
- Certificate in Regulated Investment Funds – *Three cohorts of students have so far participated on our introductory level 8 certificate.*
- Micro-credentials – *New for the academic year 2024/25, we are now running shorter micro-credentials on Sustainable Finance and ESG, Fund Accounting and the Investment Funds Industry.*
- Conferences – *Each year we have hosted a student conference where we have brought together our institutions, industry experts, senior leaders in the regional investment fund industry and our students.*
- Seminar Series and Breakfast Briefings – *We have hosted a series of podcasts, online seminars and in-person breakfast briefings on some key issues for the regional, and wider, funds industry.*
- Work Related Research Projects – *As an output from our master’s award, we now have several work-related research projects completed.*
- Advocacy – *We have contributed to government policy and strategic development of the sector, advocating for the role of skills and education as an important enabler for the industry. We have also actively worked with industry to enhance gender balance on our executive programmes and to investigate barriers to participation by female executives.*
- Presentation to IDA inward investment site visits – *We have been involved in several IDA visits. The project is presented as an exemplar of the engagement that exists between industry and the sponsoring universities in the context of financial services and investment funds.*
- Undergraduate Awareness – *We have run several events on campus to promote the industry and opportunities available, both from internship and graduate perspectives.*
- Undergraduate Modules – *We have delivered modules on the undergraduate curriculum, further increasing the visibility of the industry.*

Most Innovative Achievement

Our ‘mirroring’ model of programme development and delivery has meant that a diverse range of students across two large regions can leverage the experience and expertise of staff at two universities while also benefiting from expert input from industry. This works from a cost, resourcing and access perspective. Through use of this model and the economies of scale it creates, we have been able to pool our resources to create, for the first time, bespoke, customised courses for a niche industry in need of upskilling and also create a rich network of diverse junior and mid-level professionals across both regions who had previously felt excluded from industry networking opportunities due to their level.

In addition, the programme has multiple enrolment points across the cycle which also has the effect of increasing the cost efficiency of the programme and it has the built in flexibility of two embedded awards for those who are unable to commit to the full two and a half years of the master’s award.

Project Summary

Technological University Dublin and South East Technological University are catalysts for entrepreneurial activity and innovation in their regions. GROWTHhub seeks to magnify this role by enabling the development of students and enterprise based learners as a talent pool with game changing entrepreneurial competences. In this context, the GROWTHhub project mission is to shape entrepreneurial competences and mindsets that deliver impact for learners, enterprise, and society through a connected student entrepreneurship education ecosystem. Research informed and educator-led, the project provides unique value to the ecosystem. It acts as a focal point for student entrepreneurial competence development, student entrepreneurial activity and access to expert advice. In doing so, it is a conduit between other supports in the ecosystem and provides a potential pipeline for further enterprise support within and beyond TU Dublin and SETU.

GROWTHhub activities are structured in five areas that address two target learner groups – students and enterprise-based learners.



Project Objectives

GROWTHhub project objectives are to:

- Develop entrepreneurial mindsets and skills for students and enterprise-based learners by fostering transversal skills aimed at strengthening employability and creativity and introducing entrepreneurial development pathways across disciplines to provide students, enterprise-based learners, and educators with the knowledge, skills and motivation to engage in entrepreneurial activities in a variety of settings; and opening up new learning opportunities through the practical application of entrepreneurial skills.
- Stimulate the flow and exchange of knowledge between HEIs and enterprises by creating collaborative knowledge alliance platforms which are fully embedded in the curriculum; teaming students, researchers, teaching staff and enterprise staff for a limited period; and embedding entrepreneurs and innovators in a shared learning network.
- Promote design thinking where the starting point is desirability based on problem/solution fit. Whether ideas-based or challenge-based, experimentation and validation will meet the design thinking test at the intersection of desirability and feasibility.
- Support the development of an enhanced entrepreneurship learning ecosystem including physical ideation and active learning spaces, online resources, and shared resources.



Project Outputs

The GROWTHhub project has had a transformational impact on the opportunities of all students at TU Dublin and SETU to engage in entrepreneurship learning.

- Dedicated physical creativity spaces have been established to support collaborative and active learning activities at SETU's Imaginarium TU Dublin's Ideation Lab, with additional support through audio visual and VR resources.
- Student entrepreneurship accelerator programmes have been established at both universities to support development of student enterprises.
- Twenty Entrepreneurial Ambassadors have been appointed with successful entrepreneurs inspiring, advising, and mentoring students and faculty alike.
- Sixty-seven bursary projects have been supported across all faculty and discipline areas to develop initiatives to enhance entrepreneurship learning.
- Entrepreneurship internships, including in start-up enterprises, have provided students with the opportunity to immerse themselves in the real life world of the entrepreneur.
- Students have had regular opportunities to hear from guest speakers, from all spheres of life and industries, to learn their entrepreneurial experiences.
- An annual National Entrepreneurship Educators Symposium was established to facilitate the sharing of knowledge and innovative entrepreneurship education pedagogy.
- SETU and TU Dublin have each established an internal entrepreneurship education community of practices to support sharing of entrepreneurship education pedagogy.
- A special issue of the Irish Journal of Management focusing on the development of the entrepreneurial mindset will be published in 2025.
- Advisory support has been provided to academic schools and programmes to enhance student entrepreneurship learning.
- Programmes have been co-designed and delivered to enterprise partners to develop entrepreneurial leadership competences.
- Initiatives to target groups under-represented in entrepreneurship activity including women and marginalised youth have been implemented.
- Various events such as InspireFest at SETU have been launched to visibly celebrate entrepreneurship.
- Competences relating to sustainability and climate action innovation have been targeted through cross-disciplinary initiatives such as UNSDG themed bootcamps and sustainability hackathons, and design sprint events.



Most Innovative Achievement

The GROWTHhub Entrepreneurship Education Bursary Programme supports the development of pedagogical initiatives for the different stages of student entrepreneurial learning, including:

- Creating enterprise awareness through engagement with entrepreneurial role models, competitions and events.
- Developing learner entrepreneurial capabilities such as creativity, opportunity recognition, decision-making, and interpersonal skills.
- Reinforcing entrepreneurial effectiveness attributes through independent self-direction and implementing enterprising ideas.

Using the European Commission EntreComp Entrepreneurship Competence Framework, the bursary programme has commissioned 67 projects. Types of initiatives supported include (i) designing

cross-disciplinary initiatives that bring together students from different programmes, (ii) developing pedagogical tools that use bootcamps, virtual reality, storytelling, and gamification approaches, (iii) developing new modules such as Digital Entrepreneurship and Disciplined Innovation, and (iv) supporting student-led initiatives such as the GROWTHhub Café and the Enactus society.

The GROWTHhub Bursary Programme has also contributed to the GROWTHhub National Entrepreneurship Educators Symposium, to share best practice, while also hearing from global thought leaders in entrepreneurship education. Some bursary recipients have delivered workshops on their initiative and were nominated by attendees for the Entrepreneurship Educator award based on the innovativeness of their practice. The event has been successful in reinforcing a national community of practice and has contributed to a number of collaborative initiatives.

MICRO-CREDENTIAL LEARNER FEE SUBSIDY

Number of
Projects

21

Micro-Credential
Courses

654

Micro-Credential
Places

13,879

NFQ
Levels

6-9

ECTS

1-30



Higher Education 4.0 Project

Project Summary

Atlantic Technological University's Higher Education 4.0 Project is designed to transform the way adult learners and employers engage with third-level education, by using innovation and technology to provide pathways into and through higher education and employment.

The project is split into two distinct themes – Career and Learning Pathways (Theme I) and Innovation Projects (Theme II).

Career and Learning Pathways supports Recognition of Prior Learning (RPL) and the flexible, online career guidance service, MyCareerPath. It is focused on accessibility and future proofing learners with relevant skills for employment and is an external facing service to people in the workplace.

The second theme under Higher Education 4.0 is the internal facing Innovation Projects, which is building agile systems to allow ATU to respond quickly to employer and learner needs in an efficient, cost-effective way.



Project Objectives

The Higher Education 4.0 Project set out two key objectives, namely, to create an external-facing Career and Learning Pathways service that would engage employers, employees, lifelong learners and those wishing to return to education; and, secondly, to build internal-facing infrastructure to respond rapidly and effectively to the training and higher education needs of employers, employees and lifelong learners.

Under Theme I, the project's aim has been to provide careers/study advisory services, focused on accessibility and future proofing learners with industry relevant skills.

The MyCareerPath service is designed to support prospective students in the process of mapping out their career options and trajectory and the training that they would need to undertake to achieve this. It also engages with industry to understand their needs and to support them in facilitating lifelong learning for their employees.

The aim of the Innovation Projects is to develop new courses responsive to the requirements of learners and employers. By establishing an internal facing Instructional Design (Lean Content Development) team to support academics, the project is introducing new modes and methods of learning, including work-based and project-based learning, micro-credentials, MOOCs (Massive Open Online Courses), adaptive learning, and remote labs.

Project Outputs

- The flexible, online careers guidance service, MyCareerPath, has been rolled out and utilised by individuals and companies, including industry partners Forward Emphasis International, Medtronic, MeritMedical, Abbvie, Abbott and Mayo Sligo Leitrim Educational Training Board (MSLETB).

- We use MyCareerPath to engage with lifelong learners, providing a career development service supported by elearning and psychometric testing. Learners receive career guidance support from qualified career guidance professionals – this is unique to the ATU offering and feedback from learners underline they place huge value on this element of the service.
- Working closely with the HCI Pillar 3 funded RPL project, our Recognition of Prior Learning Preparation pathway also supports learners.
- Embracing new technologies and processes, including AI, Innovation Projects has developed courses responsive to the needs of learners and employers.
- Key to this is the Instructional Design team, made up of subject matter experts proficient in software and technologies used for online learning, graphic design, and media production for online content. In addition to building a lean content development toolkit for lecturers, the team has produced over 3,000 Reusable Learning Objects and 24 Reusable Learning Modules that can be utilised across various courses.
- In addition, four Work-Based Learning courses, two Project-Based Learning courses, two Major Awards, eight Minor Awards and ten MOOCs have been established under Innovation Projects.
- Two Remote Labs (allowing students to gain hands-on experience with state-of-the-art technology that is currently used by top employers), Digital Credentials, two Adaptive Learning programmes, and the establishment of professional recording studios on each ATU campus are other successful sub-projects.
- Physical MakerSpace facilities have been established on the Galway and Sligo campuses and we are in the process of identifying a space for one in Donegal. A successful ATU MakerSpace outreach programme also visits secondary schools across the region, encouraging students to pursue STEM subjects at third level.

Most Innovative Achievement

The Sustainable Tourism and Visitor Experience Lab at ATU (STORYATU), which is a collaboration between the nine ATU campuses, seeks to tackle the social, cultural, economic, and environmental challenges facing the tourism industry across Ireland.

STORYATU is striving to do this by building on new and existing partnerships with key stakeholders in local authorities, state agencies, tourism industry enterprises, and communities across the island – and internationally – to address local challenges and collaborate with national and international researchers on global solutions.

The impact of tourism on climate change urgently requires data that will inform sustainable change built on established sustainable tourism indicators. The data collected by STORYATU offers decision-makers critical real-time data to facilitate evidence-informed planning and decision-making.

One of STORYATU's standout projects is Ireland's first INSTO (UN Tourism International Network of Sustainable Tourism Observatories) observatory. Hosted by ATU, this observatory became a member of INSTO in November 2023.

INSTO is a global network of tourism observatories dedicated to monitoring the economic, environmental, and social impact of tourism at the destination level and, as Ireland's first INSTO observatory, this initiative aligns with UN Tourism's commitment to fostering sustainable and resilient growth in the tourism sector through robust measurement and monitoring practices.

iEd Hub

Lead Institution University College Cork

Partner Institutions

Munster Technological University

Project Summary

The iEd Hub is an innovative educational initiative formed through a partnership between University College Cork, Munster Technological University, and life sciences industry stakeholders. It aims to develop the best future leaders in the life sciences industry by bridging the gap between academic learning and industry needs.

The iEd Hub offers a range of holistic programmes, each designed to combine critical transferable skills with technical expertise tailored to industry requirements. What sets iEd Hub apart is its team of professionals with extensive industry experience, providing a unique blend of academic rigor and practical insights.

The iEd Hub addresses a crucial challenge in the life sciences sector - the need for industry-ready graduates who can make an immediate impact. By co-creating programmes with industry partners and utilising state-of-the-art facilities, the iEd Hub ensures that students are equipped with relevant skills and knowledge, effectively closing the gap between education and industry demands.

Project Objectives

Ireland is a world-leading location for life sciences, home to 13 of the world's top 15 pharma companies and 14 of the largest 15 medtech companies. Employing an estimated 100,000 people, the sector exports over €120 billion annually, making it one of the keystones of the Irish economy. The main concentration of this activity is in Munster.

The objective of the iEd Hub is to develop the future leaders of the life sciences industry, contributing to solving critical skills demands in a rapidly evolving sector through innovative, high-impact educational solutions. This is pursued through several focus areas:

- Bridging the gap between academia and industry, offering programmes that combine critical transversal skills with technical expertise tailored to industry requirements.
- Creating a pipeline of industry-ready talent, capable of delivering immediate impact and addressing real-world challenges, fostering innovation and excellence.
- Offering flexible, responsive education solutions, catering to diverse industry needs. Continuously refining programmes based on industry feedback, ensuring relevance and alignment with current and future trends.
- Facilitating a seamless transition from education to the workplace by providing hands-on experiences with cutting-edge technologies and industry-standard practices.
- Fostering collaboration between academia and industry to drive innovation and address emerging challenges in the life sciences field.





Project Outputs

The iEd Hub has created a robust educational platform built on three pillars: an engaged and relevant industry network, an innovative process for course design and delivery, and a model for attracting and producing exceptional graduates.

Our industry network now comprises 34 deeply-engaged companies. The success of our approach is evident in the 100% job offer rate for our first cohort of graduates, securing positions in prestigious full time staff roles or graduate training programmes with top life sciences MNCs in the region. Our collaborative projects, like the one with GE HealthCare and Hovione shortlisted for the Best Use of Technology at the Pharma Industry Awards 2024, demonstrate the success of our industry engagement.

Our course design and delivery process is a primary differentiator. Led by practitioners with extensive industry experience, our team brings a unique blend of academic rigor and real-world insights. This approach ensures our programmes develop professionals with both essential transferable skills and technical expertise, addressing the holistic needs of the workforce.

Our iXOM model (see 'Most Innovative Achievement') exemplifies our innovative approach, and has allowed us to attract and produce exceptional graduates who are prepared for industry.

We have developed 19 new courses ranging from master's degrees to micro-credentials. This diverse portfolio allows us to cater to the varied needs of the life sciences sector, providing flexible, responsive education solutions.

We have established iEd Hub as a unique, industry-experienced course design team, adopting an iterative approach to course development focusing on 'Design-Build-Test-Learn'. Having built a robust methodology, we are analysing market needs, building networks, and sourcing appropriate infrastructure to deliver cutting-edge education. We continue to

evolve, driven by our passion for transforming life sciences education and developing the industry leaders of tomorrow, supporting Project Ireland 2040, the European Education Area, and the Digital Education Plan 2021-2027.

Most Innovative Achievement

The iEd Hub's iXOM (Industrial X, Operations and Management) model represents a ground-breaking achievement in education, perfectly embodying our mission to develop the best future leaders of the life sciences industry.

It combines industry-focused teaching with a unique curriculum structure: one-third technical expertise, one-third operations, and one-third management, complemented by an internship and practitioner-led, competency-based teaching.

Our MSc in Industrial Pharmaceutical Sciences, Operations & Management exemplifies this model. All graduates from the first year of the programme have secured roles with leading companies. The course is now heavily oversubscribed, with an excess of placement offers from industry partners, and has been shortlisted for the Pharma Industry Awards 2024.

This holistic approach, bringing together multiple academic disciplines with industry expertise, has positioned the iEd Hub as a go-to partner for solving skills challenges in the life sciences sector. Our impact is recognised in the Expert Group on Future Skill Needs Report on Skills for Biopharma 2024, which specifically recommends further utilisation of the iEd Hub to strengthen industry-academia collaboration.

By developing professionals with both technical prowess and essential transferable skills, the iEd Hub is developing the future leaders of the life sciences industry, supporting a key component of the Irish economy.

IKC3

Ireland's Knowledge Centre for Carbon, Climate and Community Action

Lead Institution *Munster Technological University*

Partner Institutions *Trinity College Dublin,
University College Dublin*

Project Summary

The IKC3 project is building a national platform for co-development and co-delivery of knowledge and skills to support and enable enterprise and society to adapt and transition to a decarbonised economy and embrace sustainable living as the new normal. The consortium, led by Munster Technological University in collaboration with Trinity College Dublin and University College Dublin, involves an extensive national and EU wide network of partners, including the European Institute of Innovation and Technology Climate-KIC, enterprises, enterprise clusters, local government, civic and social innovators. Delivery of a sustainable, circular, low carbon economy, which responds to the climate emergency is a national and global priority.

Over the course of the project, IKC3 is taking a radical approach deploying a quintuple helix model of innovation to education, integrating state of the art pedagogies and learning pathways including stackable

micro-courses, summer schools, dual and collaborative learning via deep learning demonstrations and micro-credentials.

Project Objectives

- Validated skills needs, gap analysis and foresight and horizon scanning methodology
- Lifelong learning programmes developed and validated
- Micro-courses and micro-credentials achieved
- Recognition of prior learning in place
- Multi-university student curated learning journey
- Turas Summer School and climate innovation journey validated
- Deep learning demonstrations validated



Project Outputs

- Continuing Professional Development
- Micro-credentials
- Climate Leadership Development
- Sustainability for SMEs
- Marketing your Green Sustainability Credentials
- Circular and Sustainable Design Skills Using 3D Printing
- Introduction to Sustainability and Climate Transformation
- Business Innovation for the Bio-economy
- Regenerative Tourism for SMEs
- Lifelong learning
- Certificate in Circular Economy
- Masters in Regenerative Tourism
- Postgraduate Certificate in Climate Entrepreneurship
- Graduate Diploma in Carbon Accounting & Life Cycle Assessment
- Systems Innovation for Sustainable Enterprises and Communities
- Experiential Learning Programmes
- Turas
- MOOC in Natural Products
- Community-based education
- Deep learning demonstrator – Systems Innovation for Sustainable Enterprise and Communities (SISEC)
- Sustainable farming
- Digital skills platform developed
- Sustainable Professionals Network Ireland

Most Innovative Achievement

The most innovative aspect of the IKC3 project is the use of Systems Thinking and Systems Innovation as both a programme design tool and pedagogy for the development and delivery of micro-credentials. This strategy has been taken across a range of programmes developed by IKC3 such as the Turas (Summer School), Deep Learning Demonstration (Climate Innovation Program), CODE Green (Primary Schools programme) and Haberdashery (Sustainable Fashion Innovation Programme for Secondary Schools).



This approach has provided a framework for the development of climate and sustainability focused programmes that is flexible to adapt to the vast array of challenges and subject matter that falls under this wide thematic domain. This enables the programmes to adapt to the unique perspectives of the learner and learner groups whilst providing learners with the skills and knowledge to explore climate change and sustainability with a wider viewpoint, interrogate and innovate.

IMI4

Postgraduate Certificate in Innovative Materials for Industry 4.0

Project Summary

IMI4 is a materials-focused programme for a state-of-the-art, industry-led applied academic course. It addresses the limitations of materials education in Ireland and offers a novel, progressive, cutting-edge solution to this under-valued competency.

Course content of this wholly online programme is delivered through disruptive teaching (synchronous and asynchronous learner engagement, online accessible content, VLEs, Extended Reality, Immersive Content, interactive playback, and applied projects). Associated content combines online discussion with virtual laboratory experiences. The programme is contributing to a differentiated instructional style which will appeal to students of every applicable level and international location.

The course deals with the technology noted as Industry 4.0. It offers students a European context for the Irish market and will prepare them for enhanced interaction within the EU, through the training of the employees of the partner companies.

Project Objectives

The SMART goals for the proposed course are:

1. Specific - The development of a bespoke postgraduate course, which will develop critical materials expertise in regional and national industrial partners.
2. Measurable - The programme will have learner and graduate numbers with a range of industrial companies engaging with the course for employee upskilling.
3. Attainable - The course is flexible and each module can be carried out as a single award. Ongoing industrial workshops will ensure relevance of the course material.
4. Relevant - The area of materials is a much sought-after expertise in terms of Manufacturing 4.0 technologies, failure analysis and emerging Industry 5.0 technologies.
5. Time-Bound - The project goals will be completed as per work package and Gantt chart timings.



Project Outputs

The IMI4 programme outputs focus on delivering a comprehensive, industry-relevant educational experience in materials science with the creation of a bespoke postgraduate course that addresses the skill gaps in materials expertise for both regional and national industrial partners.

- A significant output of the programme is its structure as a fully online programme, incorporating disruptive teaching methods such as virtual learning environments (VLEs), extended reality (XR), immersive content, and interactive playback. These tools are designed to enhance learner engagement, making the course accessible to a wide range of students.
 - The provision of applied learning opportunities through virtual laboratory experiences and hands-on projects using virtual reality (VR). These elements equip students with practical skills and experience in dealing with Industry 4.0 technologies, preparing them for immediate application in the workforce. Additionally, the course is designed to be modular, allowing students the flexibility to take individual modules as stand-alone qualifications or as part of the larger postgraduate programme.
 - The programme also delivers ongoing industrial workshops, ensuring the content remains aligned with the evolving needs of the manufacturing sector, particularly in areas like failure analysis and emerging Industry 5.0 technologies. These workshops foster close collaboration between academia and industry, enhancing the relevance and applicability of the course material.
- A measurable increase in learner and graduate numbers, with industrial companies participating actively by enrolling their employees for upskilling which directly contributes to workforce development in line with European market standards, enhancing Ireland's industrial competency and its integration within the broader EU framework.

In summary, the IMI4 programme outputs include a cutting-edge materials course, flexible learning pathways, practical industry-aligned experiences, and a significant contribution to upskilling the workforce in line with Industry 4.0 and 5.0 advancements.

Most Innovative Achievement

The integration of extended reality (XR) and immersive content into materials education. By incorporating virtual laboratories and interactive simulations, the programme provides students with hands-on, practical experience in a fully digital environment. This innovation breaks away from traditional teaching methods, offering an experiential learning model that allows students to engage with cutting-edge technologies such as Industry 4.0 without the need for physical labs.

The use of XR not only enhances the learning experience but also ensures that students from any location, even those outside Ireland, can fully participate in high-quality, practical education. This approach makes advanced materials science education more accessible and inclusive while maintaining a high level of interactivity and engagement.

Moreover, combining synchronous and asynchronous engagement with these advanced tools allows for a more flexible and personalised learning journey, adapting to the individual needs of students and industry professionals. This innovative blending of technology with education positions the IMI4 programme at the forefront of modern materials science training, setting a new standard for how technical education can be delivered in an increasingly digital world.

MicroCreds

Lead Institution Dublin City University, Irish Universities Association (IUA)

Partner Institutions Maynooth University, Trinity College Dublin, University College Cork, University College Dublin, University of Galway and University of Limerick.

Project Summary

MicroCreds is an ambitious 5-year project working to develop, pilot and evaluate the building blocks required for a transformation in lifelong learning through university micro-credentials. Micro-credentials have the potential to reimagine and reframe the relationship between learners, universities, enterprise and civil society partners, generating a step change in lifelong and life-wide learning.

Our ambition is for MicroCreds to address barriers to participation in lifelong learning, including time constraints for learners and rigidity across more traditional programme provision and delivery. The inherent flexibility of micro-credentials facilitates learners in accessing learning in discrete, smaller units, at both a time and pace which allows for greater balance with personal and professional commitments.

Project Objectives

Our ambition for the MicroCreds project is to establish a lasting framework, infrastructure and capability to embed micro-credentials as university-created, accredited and quality-assured learning opportunities across the partner universities, to accurately respond and evolve to identified and priority skills needs. Furthermore, our micro-credentials will support and enhance overall engagement with university lifelong learning.

To achieve this goal, we have implemented four key strands:

STRAND 1: Developed a National Framework for Micro-credentials to create a common understanding of what a micro-credential is.

STRAND 2: Established MicroCreds Innovate, a sustainable model of data-informed university-enterprise collaboration.

STRAND 3: Created a centralised National Platform for micro-credentials, MicroCreds.ie, to make it easier

for learners and enterprises to engage with lifelong learning.

STRAND 4: Agilely developed & flexibly delivered a suite of micro-credentials across the partner universities.

Project Outputs

Through a collaborative approach, MicroCreds has positioned Ireland as the micro-credential leader in Europe. Some of the key impacts from the project since it commenced four years ago include:

- Development of a clear, coherent and consistent understanding of micro-credentials.
- Proactive engagement with the national skills eco-system to raise awareness of and embed micro-credentials.
- Enhanced ability to collectively engage with and across external partners to address critical skills needs in Ireland.
- Development of an evidence-based model of university-enterprise collaboration to foster a legacy of meaningful engagement.
- Sharing of best practice approaches in the development and implementation of micro-credentials, supporting quality of content delivery for learners.
- Development and launch of a first-of-its-kind national platform for micro-credentials in Europe: MicroCreds.ie.
- Implementation of an impactful national marketing campaign to drive awareness of micro-credentials.
- Advancing the understanding of the motivation and barriers of micro-credential learners in Ireland through quantitative and qualitative research.



Most Innovative Achievement

The National Framework for Micro-Credentials has been a key driver for MicroCreds, promoting a shared understanding across partner universities and fostering the development of a micro-credential ecosystem, an initiative which has heightened learner and enterprise engagement. MicroCreds played a pivotal role in the development of the 2022 European Council Recommendation on Micro-credentials for Lifelong Learning and Employability, defining and establishing EU standards for quality and transparency. This has facilitated significant collaboration on micro-credentials across Europe.

MicroCreds Innovate has been instrumental in building university-enterprise partnerships, and removing barriers to collaboration. These partner-

ships now extend beyond micro-credentials, enriching cooperation between partner universities and enterprises of all sizes.

The launch of MicroCreds.ie in 2023 was a significant milestone for learner engagement with micro-credentials in Ireland. As the first national platform of its kind in Europe, it was designed with UX best practices to make lifelong learning more accessible and address enterprise skills gaps.

Sectoral Outlook: The structure of the MicroCreds project created open forums for the MicroCreds partner universities to collaborate at various levels, identifying and working constructively to address challenges such as recognition and stacking, and supporting the integration of micro-credentials into the education and skills ecosystem.

REEdI

Rethinking Engineering Education in Ireland

Lead Institution Munster Technological University

Partner Institutions University of Limerick

Project Summary

The REEdI (Rethinking Engineering Education in Ireland) project is designed to transform engineering education to align with future industry demands and boost student engagement and retention.

It aims to deliver an innovative framework and pathways to engineering education that combine industry-relevant skills, work-integrated learning, and problem-based approaches to make engineering education more practical and inclusive. By fostering collaboration between academia and industry, REEdI ensures learners gain direct exposure to industry practices, preparing them for real-world challenges.

The goal is to reshape engineering education to produce engineers of the future for Ireland's manufacturing sector, while also providing lifelong learning opportunities for reskilling and upskilling learners in the latest technologies to keep pace with rapid advancements. Central to REEdI's mission is enhancing STEM accessibility for diverse groups, integrating real-world applications, and strengthening industry links. This aligns with Ireland's National Strategy for Higher Education to 2030, emphasising an inclusive, innovative, and society-oriented education model.

Project Objectives

The REEdI program focuses on developing the engineers of the future by cultivating essential transversal skills alongside technical expertise. It emphasises practical, hands-on learning and project-based approaches, preparing students for challenges in sustainability, digital transformation, and the evolving engineering landscape. Innovative pedagogies such as work-integrated learning, virtual and augmented reality tools, advanced manufacturing techniques, and problem-based learning are utilised to create a more engaging and relevant educational experience.

The REEdI project aims to strengthen industry collaboration by establishing stronger links between aca-

demia and industry, exposing students to real-world challenges and practical applications. By equipping engineering graduates with essential skills, competencies, and experiences—including problem-solving, teamwork, and adaptability—REEdI enhances employability and addresses the skills gap in engineering.



demia and industry, exposing students to real-world challenges and practical applications. By equipping engineering graduates with essential skills, competencies, and experiences—including problem-solving, teamwork, and adaptability—REEdI enhances employability and addresses the skills gap in engineering.

Finally, REEdI promotes diversity by increasing the participation of underrepresented groups, particularly women, in engineering, and supports lifelong learning through continuous professional development opportunities for students and industry professionals.

Project Outputs

A key output of the REEdI project is the launch of an innovative engineering degree—the Bachelor of Engineering (Hons) in Mechanical and Manufacturing Engineering at Munster Technological University (MTU) (MT834). This programme, the first of its kind nationally, was co-created with 25 regional industry partners to address their skills needs.

The REEdI project has launched two unique learning spaces at Munster Technological University: the REEdI Innovation Lab and the REEdI Ideas Lab. The Innovation Lab offers cutting-edge 3D printing and robotics, while the Ideas Lab serves as a creative space for brainstorming and collaboration. Together, they foster innovation, problem-solving, and creativity, enriching the learning experience. These labs also support staff development through work-



shops and provide advanced facilities for enterprise partners, ensuring students have access to leading technologies.

To foster collaboration among third-level institutions embedding immersive technologies into their curricula, the REEdI project has established the Virtual Immersive Reality for Transformative University Education (VIRTUE) Network. As an innovative initiative within REEdI, VIRTUE leverages the potential of Virtual Immersive Reality (VIR) technologies to revolutionise education. Initially composed of HCI Pillar 3-funded projects, this network is strategically designed to address the challenges of integrating immersive technologies into higher education. VIRTUE seeks to create a dynamic, inclusive, and transformative learning environment by embedding these advanced technologies into educational frameworks, ultimately enhancing the quality of teaching and learning across national institutions.

Conducting and disseminating research is a crucial output of the REEdI project, driving innovation and knowledge sharing in engineering education. Since 2022, REEdI's 40+ publications showcase innovative approaches, foster collaboration, encourage peer review, and provide evidence-based solutions that can be adopted globally. This focus on research positions REEdI as a thought leader, continuously advancing the standards of engineering education and ensuring its contributions have a lasting impact on both the academic landscape and industry practices.

Most Innovative Achievement

The REEdI project has developed an agile and innovative framework for the design, development and delivery of engineering education in Ireland. The project has built on the success of world-leading cutting-edge models of engineering pedagogy to deliver a transformative programme for the next generation of engineers.

A standout feature of REEdI is the 50% industry-paid work placement, giving students extensive real-world experience by spending half of their Level 8 Degree in a paid engineering environment. This approach bridges the gap between academics and industry, helping students develop relevant skills, gain practical insights, and build valuable professional networks. Industry feedback confirms that REEdI graduates are well-prepared and ready to contribute immediately, equipped with both academic knowledge and hands-on experience.

Immersive technologies are also a cornerstone of REEdI, integrated into over 50% of the core modules. These include VR, 360-degree content, bespoke applications, and live immersive lectures, with 17 software applications and six hardware devices enhancing learning from years 1 to 3. Immersive VR is also used in personal development modules to support skill acquisition in areas like communication and problem-solving, with significant improvements reported by students.

REEdI's innovative approach has been recognised with awards, including the Education Awards Best Use of ICT Technologies, establishing it as a leader in educational innovation.

Recognition of Prior Learning

Realising the Potential of Recognition of Prior Learning and Lifelong Learning in Irish Higher Education.

Project Summary

The project recognises the crucial importance of lifelong learning, ensuring adults have opportunities to upskill and reskill throughout their lives. A key element in this is valuing and recognising informal and non-formal learning through Recognition of Prior Learning (RPL). By acknowledging individuals' existing knowledge and experiences, RPL enables them to apply these toward higher education qualifications. With fourteen partner higher education institutions, the project aims to embed, enhance, and expand RPL provision in a consistent and coherent way. Co-sponsored by the Technological Higher Education Association (THEA) and the Irish Universities Association (IUA), the project is coordinated by THEA's project management office. Collaboration among project leads, academic leaders, employers, learners, and RPL experts is essential to this effort, with oversight from Registrars/Vice Presidents for Academic Affairs. This initiative promotes inter-institutional cooperation and peer-learning and is working toward a sustainable and scalable RPL model for the future. See www.priorlearning.ie for more information.



Lead Institution South East Technological University

Partner Institutions Atlantic Technological University, Dublin City University, Dundalk Institute of Technology, Institute of Art, Design and Technology, Dun Laoghaire. Maynooth University, Munster Technological University, South East Technological University, THEA, IUA, Technological University Dublin, Technological University of the Shannon, Trinity College Dublin, University College Cork, University College Dublin, University of Galway, University of Limerick.

Project Objectives

Over the past four years, the RPL project has been steadily progressing towards three key objectives: i) embedding RPL policy and practice in a consistent manner within and across the partner higher education institutions, ii) building staff capacity to effectively practice and support RPL, and iii) working with employers to expand upskilling and reskilling opportunities for workers. Throughout this time, the project has been measuring its success through a range of key performance indicators. These include an increase in the number of learners having their prior learning recognised, enhanced and more accessible learner information, and higher uptake of staff in professional development activities. Institutions are also enhancing their quality assurance procedures, while increased promotional efforts and outreach are raising awareness of RPL opportunities with prospective learners and enterprise.

Project Outputs

From 2021-2024, 7,351 learners benefited from RPL. It's estimated that approx. 11,000 learners will have benefited from RPL in the fourteen institutions over the project's duration.

The capacity to develop datasets has been a major milestone of the project. This work has been underpinned by the development and agreement of the RPL Technical Definition RPL; a guide for HEIs on what to count as RPL. The definition is driving the ongoing integration of RPL data collection processes into Student Information Systems, with four institutions aiming for live data capture by 2025. This foundational work is in turn informing the development of SRS 2.0, aiming to align institutional and national data collection processes to the greatest extent possible.

Raising awareness of RPL with learners and enterprise and enhancing and expanding learner information has been an area of focus for the project. Significant outputs include the development of www.priorlearning.ie,



13 new institutional webpages, the inclusion of RPL in student handbooks in 6 HEIs, over 300 engagement/outreach activities with enterprise, 40 new promotional videos and vibrant social media channels promoting RPL online. The project's 'high quality multimodal promotional materials' were complimented in a recent report from QQI entitled 'Review of the Landscape of Practice Supporting Access, Transfer and Progression in Irish Education and Training'.

Finally, recognising that well-supported and trained staff are at the heart of effective RPL practices, we are immensely proud of our staff development initiatives, having run three iterations of the RPL Digital Badge (a fourth is currently underway). So far, 267 Badges and 47 Facilitator Badges have been awarded, underscoring the Badge's success in equipping staff with the knowledge to support and practice RPL. In addition, 12 new tools and resources have also been developed to support staff.

Most Innovative Achievement

The development of the Pilot Framework for RPL in Higher Education was voted the project's most innovative achievement by the network of Project Leads. One of the key barriers to embedding RPL has been the varied interpretations of the concept. The Framework addresses this by promoting a shared understanding and outlining what quality-assured, learner-centred RPL looks like. The Framework has underpinned all project activities, from expanding and strengthening learner information to staff development initiatives.

Created through a consultative process in 2022, the Framework outlines a five-step approach—information, identification, documentation, assessment, and recognition/certification—focusing on informal and non-formal learning, such as knowledge acquired through work experience. This fosters consistency across HEIs, supporting transparent, equitable, and flexible processes.

The Framework's impact lies in expanding access to and through higher education, especially for mature learners, professionals, and underrepresented groups. Since its introduction, ten HEIs have adopted new policies aligned with the Framework, empowering learners to gain entry, advanced standing, or exemptions. Its influence also extends to professional and regulatory bodies, some of whom are incorporating its principles into their work with institutions, providing the conditions to open up new opportunities for learners and close skills gaps at a faster pace.

Sustainable Futures

Sustainability in Enterprise: Delivering a Low Carbon Future

Lead Institution University College Cork

Partner Institutions Atlantic Technological University,
Maynooth University

Project Summary

Sustainable Futures is a sustainability education project focused on climate action, sustainability, and achieving net zero in industry and enterprise. It aims to empower leaders to act so that humans and nature can thrive for generations to come. Sustainable Futures is led by University College Cork in collaboration with Maynooth University, Atlantic Technological University and industry partners. Sustainable Futures brings together science and enterprise, academia and industry, to drive sustainability and decarbonisation by developing new courses that draw upon UCC's renowned leadership in sustainability.

The trans-disciplinary approach is particularly suited to address the complex challenges of the transition to a low-carbon economy. Businesses require a skilled workforce who can place climate concerns at the heart of strategy, operations, and decision-making while at the same time maximising employment provision. Sustainable Futures empowers businesses to not only meet its new legal requirements but to realise new opportunities while meeting Ireland's climate challenges.

Project Objectives

1. Sustainable Futures Lab, a space dedicated to engaging enterprise and pursuing enterprise informed curriculum development.
2. Higher Diploma (Level 8) entitled "Sustainability and Climate Action for Enterprise". This programme is aimed at university graduates from all disciplines and operational staff within the industry partners, utilising peer-to-peer learning.
3. Postgraduate Certificate (Level 9) and full Masters in "Sustainability in Enterprise" (Level 9). These programmes are aimed at early to mid-career, current and aspiring leaders who want to develop their capacity to drive the business response to sustainability challenges.
4. "Transformative Leadership for a Sustainable Future" immersion programme in partnership with Irish Management Institute. This programme for senior level managers focused on embedding sustainability throughout entire organisations.
5. Micro-Credentials aimed at professionals across all sectors wishing to enhance their skills to deliver on all aspects of sustainability within enterprise. These micro-credential offerings are derived from modules developed for the graduate programmes, as well as new bespoke offerings, targeting key skills needs as identified with industry in the Sustainable Futures Lab.
6. Enhance all course offerings based on enterprise-informed curriculum development.
7. Thought leadership and public engagement – Sustainable Futures Forum, Culture Night and Lifelong Learning Festival events.

Project Outputs

- Enterprise-informed Curriculum Development: we engage with industry to map the skills required for the transition to sustainable enterprise practices through decarbonisation. Outputs of the project are providing benefits across a range of industries.
- Flagship Programmes: PGCert/MSc in Sustainability in Enterprise and HDip in Sustainability and Climate Action for Enterprise. Our community, collaborative environment and pioneering programmes are producing leaders who are equipped to lead the transition to a sustainable, net zero and nature-positive future.

- Micro-Credentials: Introduction to Sustainability and the Natural Environment; Introduction to Sustainable Enterprise; Systems Thinking in Environmental Sustainability; Photovoltaic Systems; Climate Change: Science, Policy and Global Impact; Wind Energy; Energy Innovation; Progressing Towards Sustainable Industry; Sustainable Reuse of Existing Structures; Clean Energy Futures.
- Sustainable Futures Forum: On 27 November 2023, in the lead-up to COP-28, Sustainable Futures hosted this international thought leadership event entitled Sustainable Futures Forum. Speakers and audience members included leaders from business, academia, international organisations, students and civil society. The Sustainable Futures Forum:
 - Provided thought leadership and strategic direction for transformational sustainability education and research;
 - Catalysed collaborative climate action at pace and scale through public discourse;
 - Inspired thinking around sustainable and nature-positive culture shift;
 - Discussed economic opportunities of net zero and leveraging public and private sector investment;
 - Positioned Sustainable Futures at the forefront of national and international sustainability and climate action leadership with a new platform for shaping policy;
 - Provided a launch-pad for future fora and meaningful public engagement.
- Regular Sustainable Futures Lab events science weeks, sustainability summer schools, innovation start-up labs, and enterprise engagement events.



Most Innovative Achievement

The Sustainable Futures Lab at University College Cork is a convening point for cutting-edge knowledge and thought leadership, innovation, learning, communication and dialogue on sustainability and climate action. It is also used for engaging with industry and for sustainability skills mapping.

Our suite of Innovative and Agile Sustainability Education Programmes includes flexible part-time and full-time, online and in-person postgraduate programmes and micro-credential offerings. Our range of courses are available at all levels and aimed at individuals at every stage of their sustainability in enterprise journey.

Our Sustainable Futures Forums shape solutions for some of the most pressing and complex sustainability and climate challenges of our time. Through our Forum, prominent figures in international development, academia, industry, and Irish society provide leadership and expert guidance on the important issues of climate justice, financing the just transition, and the role that universities and enterprises have in promoting a fair and equitable sustainable future for all. These and other thought leadership events demonstrate the Sustainable Futures team's excellence in sustainability and climate action education, citizenship, research, and innovation and showcase UCC's leadership in sustainability to a broad global audience.

Trinity Next Generation Teaching and Learning

Next Generation Teaching and Learning for the Changing Needs of Society and Industry

Project Summary

Trinity College Dublin has worked with enterprise to develop a suite of new courses across all levels (UG, PG, MCs, CPDs, and Masterclasses) supporting approx. 11,000 learners to date through flexible and innovative teaching approaches.

These transformative pedagogical innovations are reshaping teaching provision in Trinity College. They include industry involvement in the design and delivery of programmes across all work packages and a move towards an agile and rich portfolio of short courses for diverse learner cohorts.

Throughout the HCI project, Trinity has tested how best to dynamically respond to the changing needs of students and industry by trialling different approaches to curriculum design, delivery and assessment with input from academia, enterprise, and learners.

An Enterprise Eco-system is building and consolidating networks across enterprise and academia to strengthen collaboration in order to provide creative spaces for problem solving and inform future learning opportunities to benefit the workforce, society, and the economy.

Project Objectives

Trinity's HCI project is addressing skills shortages in areas of identified demand for enterprise, while driving system change in teaching delivery and opening the university to new and diverse learner groups. The project is providing a strong talent pipeline across a range of key sectors and creating rich opportunities to enhance our learning environment by deepening connection with enterprise and the wider community.

The objectives are to:

- Transform the way Trinity promotes and delivers innovation and agility within its teaching provision while connecting with the needs of enterprise and learners.

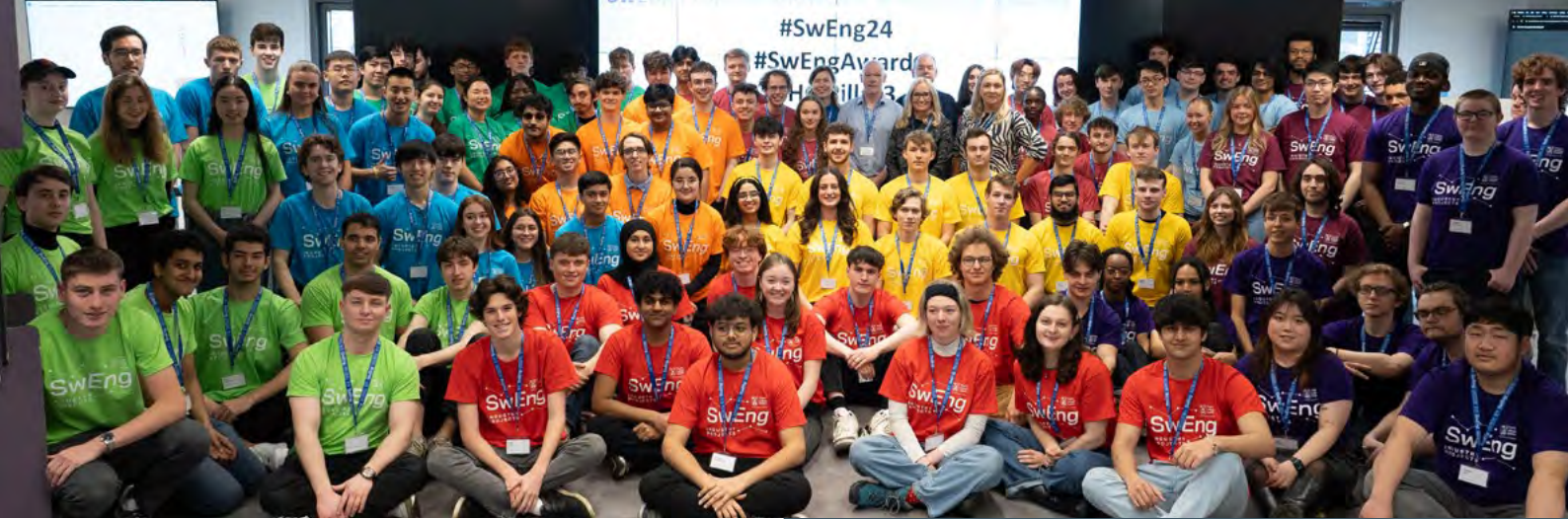
- Pivot towards online curriculum and flexible learning options which involve the learner as a co-constructor of their own award (micro-credentials).
- Future-proof graduates with enterprise-relevant skills to adapt to a changing employment landscape and emerging technologies, while fostering the development of an entrepreneurial spirit, problem-based team learning and intercultural competencies.
- Develop an Enterprise Eco-System infrastructure to build on and develop deeper relationships within industry. These partnerships are in the broad areas of environmental sustainability, health, biopharma, information technology and data analytics, and in the wider cultural space - particularly in the provision of transversal skills such as entrepreneurial and language/intercultural skills.

Project Outputs

Trinity's HCI project reaches into almost all corners of the university. Examples of project outputs include:

Innovative learning solutions:

- Students on the MSc in Regulatory Affairs for Medical Devices interact with spin-out med-tech developers on real life case studies.
- The PG Cert in Sustainable Development for Business features guest lectures from experts in organisations such as Shift, Novartis, and Ryanair.
- The CPD in Exploring Heritage Collections is open to undergraduates and professional learners. Undergraduates intern at Partner Institutions, developing transferable workplace skills. Partner Institutions fulfil their own goals around digitising, preserving, and presenting heritage materials.



Flexible learning promoted and embedded across the university:

- 38 micro-credentials across 8 schools/areas targeting identified workforce skill gaps and focusing on Trinity's areas of research strength.
- Expanded online and blended learning reach. The Certificate and Diploma in Statistics and Data Science are now fully online, enabling the doubling of student participation.

Industry-relevant skills in curriculum design:

- Modules on the PG Cert and PG Dip in Statistics and Data Science introduce industry-crucial areas (e.g., machine learning, information systems, distributed computing and security and privacy of data) – brought to life through case studies developed with industry partners.
- A comprehensive, multi-level biological data analytics curriculum equips students with cutting-edge data science skills tailored to biological research, particularly genomics, which is central to modern biological data science. Students explore real-world applications across diverse fields, from ecology to cancer research.
- A new Software Engineering core strand has been embedded in Computer Science undergraduate degrees, incorporating an 'Apprenticeship' Model. Students develop technical and transversal skills as they work with, and are mentored by, industry partners on 12-week SwEng projects followed by 6-8-month industry internships.

The Enterprise eco-system is leading on a centralised approach to enhance enterprise collaboration, target our marketing, and generate learner pipelines from within enterprise and across professional learners.

Most Innovative Achievement

Enterprise-enhanced skills-focused programmes for diverse learners

The enterprise eco-system connects academics and industry, catalysing partnerships to drive access and discovery. The focus on Trinity's areas of research expertise and thought leadership as they relate to skills for now and the future has been core.

- For example, the Trinity Quantum Alliance brings together experts from research and industry to create a vibrant quantum ecosystem in Ireland.
- Undergraduates studying Computer Science develop technical and transversal skills working on projects with 60 partner organisations.
- Postgraduates on the MSc in Pharmaceutical Manufacturing Technology tour manufacturing facilities throughout Ireland.
- Micro-credential learners apply their learning through work-relevant assessment.
- The MSc in Quantum Science and Technology, offers industry-funded scholarships to outstanding female students and students from the global south, expanding access to this area of research that will be central to future discoveries.

This culture of connectedness is driving richer learning outcomes and creating opportunities for collaboration, cross-sectoral engagement, and industry accreditations.

In parallel, the move to blended, online and short course delivery has created a more flexible learning environment; over 60% of HCI learners study part-time and online. Micro-credentials support time-poor professionals eager to further their career and keep their skills current and enterprise-relevant.

UL@Work

Project Summary

UL@Work has built a flexible, technology-enhanced learning platform that responds to digitalisation challenges and preparing students for the future world of work.

UL@Work offers a range of programmes co-designed and co-delivered with industry to enable education, up-skilling and reskilling for professional development in the age of digital transformation. UL@Work is changing modes of education. UL@Work has supported the creation of over 20 programmes across professional diplomas, master's degrees, challenge based degrees, top-up degrees and micro-credentials. This suite of programmes for undergraduate, graduate, and work-based learners supports economic progress in the digital age and encourages professional growth.

With the future-focused flexible learning approach and close collaboration with industry, UL@Work provides learners with the tools needed to handle not only today's challenges, but also those that will arise in the future.

Project Objectives

- A library of reusable and extendible on-line learning blocks to rapidly build industry relevant programmes;
 - Unique, challenge based, accelerated, engineering degrees;
 - Deep enterprise/education collaboration
 - Flexible provision of skills, via new master's programmes, top up degrees and professional postgraduate diplomas, in emerging technologies to lifelong learners.
 - HCI funding will sustain, formalise and further develop UL's institutional capability to deliver emerging technical and transversal skills in partnership with enterprise.
3. Approximately 500 learners enrolled across programmes and micro-credentials.
 4. 3 new modes of workplace learning developed including immersive degree residencies, extended, 13-month co-operative placements that feature new problem solving and reflective practice blocks, as well as new professional practice master's pathways that are at once bespoke, flexible and stackable.
 5. 80 new modules developed.
 6. 15 micro-credentials being offered in collaboration with the micro-credential project.
 7. Future and transversal skills embedded in programmes of approx 2,500 students.

Project Outputs

1. 20 new programmes created across undergraduate degrees, top-up degrees, professional diplomas and master's degrees.
2. Programmes in areas of high demand including AI, data analytics, cybersecurity, leadership, climate change communication, problem solving, human resource management and arts programmes in emerging technologies
3. Launch of state-of-the-art Virtual Learning Environment.
4. Tools to assess Digital Readiness across all UL Staff and Students. Over 70 enterprise partners engaged with the co-design and co-delivery of the suite of programmes.
5. 40 industry masterclasses.
6. 23 international partners.



Most Innovative Achievement

UL@Work has developed novel modes of education from challenge-based degrees to a first of its kind personalised master's degree.

The Immersive Software Engineering is a new computer science undergraduate degree. Students spend half their time learning on campus in a research-driven paradigm and the other half time in paid residencies within industry.

The Digital Mechatronic Engineering degree brings students the intersection of mechanics, electronics, robotics and AI/Machine Learning. Students will design and build machines, robots, and other automated systems that are now making autonomous decisions in our increasingly digitally driven world. Students

will be embedded with excellent companies for a 13-month placement where they will complete new problem solving and reflective practice modules that feature safe space ideation to enhance innovation and creativity in the workplace.

UL@Work launched a one-of-a-kind master's programme, designed for working professionals. The Master of Professional Practice is a part-time, flexible, and personalised programme combining three Professional Diplomas over five years across multiple disciplines, stacking QQI Level 9 qualifications achieved from UL or further afield. This programme meets the labour market demand of highly technical skills that are combined with transversal and business skills and easily configured to learner needs. This allows for a highly tailored learning experience specific to personal goals and interests



Virtual Labs

Virtual Laboratories in Higher Education

Lead Institution Maynooth University

Partner Institutions Dundalk Institute of Technology, Technological University of the Shannon, Dublin City University, University College Cork

Project Summary

Virtual Labs is a consortium of five higher education institutions: Maynooth University (MU) (lead), Technological University of the Shannon: Midlands Midwest (TUS), Dundalk Institute of Technology (DkIT), University College Cork (UCC), and Dublin City University (DCU) collaborating on the use of virtual laboratories as a teaching tool for the chemical/biosciences. This ambitious venture, with enterprise partners and world leading education technology providers, aims to impact over 4,500 students across the five partner higher education institutes over the project's lifetime. The consortium is leveraging education technologies and designing new laboratory curricula to develop work ready graduates with enhanced practical, project management and team working skills. Students are afforded the opportunity to experience a real work environment through virtual training and engagement with enterprise partners and industrially relevant workplace problems.

Project Objectives

The overarching goal of our collaboration is to determine and implement the optimal approach to enhancing the educational laboratory experience that best prepares our students for a future career in STEM. This is no simple task. Whilst laboratory education is a very significant, and often the most enjoyed part of an experimental science curriculum, it is constrained in terms of both time and space, and the lab remains a complex learning space with diverse cognitive and social demands. We are focused on finding the best way to provide a quality lab experience for the modern student which embeds transversal skills alongside developing experimental competencies.

Our objectives are:

1. To modernise the laboratory experience through the integration of technology and multimedia elements.
2. To engage with enterprise partners to help students transition between the teaching laboratory and the modern working environment where the 'real' scientist needs to be confident with a wide range of technical skills and digital working practices.
3. To improve standards in laboratory teaching, learning and assessment utilising feedback from students and staff to best understand where students see the value of virtual lab components to enhance their learning.

Project Outputs

- Opened Ireland's first Science-Lab Video Recording Studio in UCC.
- Upgraded laboratories at three institutions with state-of-the-art multimedia equipment.
- Development of immersive resources to facilitate training in instrumentation using virtual reality.
- Promoted Virtual Labs at facilitate events including I Wish Expo, DkIT Careers Paths in Science, BT Young Scientist and Technology Exhibition, EdTech Conference 2022, HCI Showcase, SciFest (TUS and DkIT), Cork Carnival of Science, event for second-level teachers (MU).
- Promoted Virtual Labs at national and international STEM education conferences.
- Integrated Virtual Labs into the curriculum for students in programmes ranging from undergraduate to postgraduate and life-long learners. To-date reached ~3,500 students, in more than 25 programmes.



- Reviewed teaching, learning and assessment practices through a UDL lens (universal design for learning) to enhance inclusivity.
- Implemented a Digital Badging programme to promote identification and enhance student perception that technical skills can improve competency for employment.
- Hosted multiple enterprise engagement events: advisory panel discussions, site visits and invited seminars.
- Formed a VL Student Advisory Board.
- Evaluated the project through staff and student surveys and focus groups to gain real-time feedback.
- Co-created with enterprise a micro-credential for lifelong learners, providing specialised analytical training to support the Brewing & Distilling sector.
- Developed a strong geographically disparate, collaborative team across 5 HEIs which has received national and international recognition.
- Awarded a Disciplinary Excellence in Learning, Teaching and Assessment (DELTA) Award (2024); this award recognises discipline teams for excellence in teaching and learning enhancement, with a commitment to ongoing improvement, it highlights good practices and promotes their wider adoption within higher education communities.
- Awarded an Education Award - Best Collaboration Project Award (2024). This award recognises, encourages, and celebrates excellence in the third level education sector.

- Awarded a LearnSci Teaching Innovation Award (2022) recognising innovation that positively impacts on teaching quality and enhances student learning.

Most Innovative Achievement

This project's achievements place the Virtual Labs team at the national forefront in understanding how technology driven teaching innovations can be best deployed across the chemistry/bioscience disciplines. Interactions with industry and edtech partners have helped guide the design and embedment of employability skills into practical lab courses. We have successfully implemented, at scale, and across a broad range of modules, a modern technology-supported teaching and learning approach to prepare graduates for future STEM careers. Central to this achievement has been the integration of a range of edtech tools including digital sharing tools, commercial virtual laboratory packages, VR resources and a range of in-house virtual laboratory content some of which was created in the newly established Science Studio. Creation of the studio, the first such facility in the country, is another key and lasting achievement of this initiative.

The award of Best Collaboration Project (2024), a Teaching Innovation Award (2023) and a DELTA award (2024) are key achievements; international conference activity and community and second level engagement are achieving a strong national and international profile for the project.

Sustained, structured HEI, edtech and enterprise partner engagement have contributed to the development of an industry relevant curriculum to help students succeed professionally.

HCI Pillar 3 Project Outputs

Appendix: Key Enterprise Partners by Project

1. **Advance Centre:** Intel, Microsoft, IBM, Medtronic, Equal1, AMD, Stryker, Analog Devices, KPMG, Stripe, IMR.
2. **AMASE:** Inspire 3D, 3DWIT), Design+, ReevesInsight, Stryker, Boston Scientific, D-shape, Advance3D, SEAM, STRATASYS, BAUSCH & LOMB, JABIL, SULZER PUMPS, WATER TECHNOLOGIES.
3. **Building Change:** Royal Institute of Architects of Ireland (RIAI), the Irish Green Building Council, the Grangegorman Development Agency, BothAnd Group, Rubble, Self Organised Architecture (SOA), Architekturbüro Marcello Turrini ZT, Sisk, Henry J Lyons Architects, Marsh Insurance, ARUP, Green Building Solutions, Aixopluc Architectures, Heatherwick Studio, ACT Architects, Carrig Conservation, Waterford Wexford Enterprise & Training Board, Engineers without Borders Ireland.
4. **CIRDAS:** AXA Learning Academy, Insurtech, Howden Insurance, Unum, Sunlife, Inclusio.
5. **Convene:** Workday, Microsoft, Trilogy Technologies, IBM, Diageo, Merck, Wassenburg Ltd., Screenskills Ireland and Manpea Ltd..
6. **Creative Futures Academy:** Virgin Media TV, RTÉ, 4e Virtual Design, Arts Council, Screen Ireland, Galway Fleadh, DIFF, Screen Producers Ireland, Institute of Designers Ireland, Design & Crafts Council, THISISPOPBABY, Dublin Fringe Festival, DLR Rathdown Arts Office, Element Pictures and British Council.
7. **Cyber Skills:** Mastercard, Dell, Analog Devices, JLR, IBM, JRI America, Cyber Ireland, State Street eSentire, Johnson & Johnson, Janssen Ireland, Trend Micro, Palo Alto Networks, Accenture.
8. **DASBE:** Tipperary Energy Agency, Irish Green Building Council.
9. **DCU Futures:** Accenture, Intel, Alltech, Microsoft, Sartorius, Dublin City Council, Midlands and Eastern CARO, ReDiscovery Centre, Deloitte, Stryker.
10. **Designing Futures:** Medtronic, Boston Scientific, Diligent, LibertyIT, Aerogen, SAP, Mbyronics, Galway International Arts Festival, Veryan Medical, Rent the Runway, Channel Mechanics.
11. **Enabling Future Pharma:** Aerogen, Almac Sciences, Congenica Ltd., Inflection Biosciences, Novartis Ireland, Phion Therapeutics, S3 Connected Health.
12. **Funds Academy:** BNY, State Street.
13. **GROWTHhub:** Workday, North East Inner City Partnership, Inner City Enterprise, Common Purpose Ireland, Entrepreneurs Academy.
14. **Higher Education 4.0:** MakerMeet , McGraw Hill, AWS, EU Green, UN Tourism.
15. **iEd Hub:** Pfizer, Johnson & Johnson, Boston Scientific, BioMarin, Astellas, MSD, GE HealthCare, Hovione, APC-VLE, Gilead, Rowa, Recordati, Sterling, Lilly, MeiraGTx, Stryker.
16. **IKC3:** Chambers Ireland, EIT Climate-KIC, Cube Low Carbon Centre, Fexco, Kerry County Council, Microsoft, Transition Kerry, An Post, Boots, Coca Cola, Coillte, Kerry, Logitech, KPMG, SFI.
17. **IMI4:** FW Metals, LTTS.

18. **MicroCreds:** EGFSN, Ibec, Enterprise Ireland, IDA Ireland, Regional Skills Forum, Microsoft, Glanbia, Northern Trust, The Wheel, Cpl, Johnson & Johnson Vision.
19. **REEdI:** Alps Engineering, Astellas Pharma Inc., Cleanova, EDC Progressive Engineering, Dornan Engineering, Liebherr Cranes, Reamda, Stryker, Flow Technology, Nilan Ireland, Sanmina, Thermofisher, Tricel, Dairymaster, EPS, Avonmore Electrical.
20. **Recognition of Prior Learning:** IBEC, ISME, SOLAS, National Forum for the Enhancement of Teaching and Learning in Higher Education.
21. **Sustainable Futures:** Microsoft, Logitech, CIE, Mannok, Glenveagh, Carbery Group, Blue Planet Consulting, ESB, Janssen, RTE, PM Group, Kepak, HSE, Accenture, Sisk.
22. **Trinity Next Generation Teaching and Learning:** Microsoft, SandboxAQ, IBM, Munich Re Automation Solutions Ltd., HSE, Engineers Ireland, Mason Hayes Curran, IDA, Enterprise Ireland, IBEC, Intel, MSD, Premium Power, Dublin City Council, Central Bank of Ireland, NIBRT, Health Products Regulatory Authority (HPRA).
23. **UL@Work:** AMCS group, Analog Devices, Central Statistics Office, De Puy Synthesis, Dell, ECUBERS, EI Electronics, Eli Lilly, Huawei, Intel (Shannon), IBM / Merative, Johnson and Johnson, Mongo DB, Provisio, Stryker, Takumi Precision, Valeo.
24. **Virtual Labs:** Aectas, Alltech, Analog Devices, Ulysses Neuroscience, MindConnex, WuXi Biologics, Pfizer, MSD Brinny, Agilent, Thermo Fisher, Eli Lilly, Janssen, Regeneron, Henkel, Abbott, Almac, and Jazz Pharmaceuticals.



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