

TU Dublin Annual Report 2021

T
DUBLIN
OLLSCOIL TEICNEOLAÍOCHTA
BHAILE ÁTHA CLIATH
TECHNOLOGICAL
UNIVERSITY DUBLIN





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Welcome Message from the President



When we look back at the year 2021, sustainability might not be the first topic that springs to mind. Over the last two years, our world faced an unprecedented health crisis which presented significant challenges for us all. However, this experience has also made the importance of creating a culture of sustainability even clearer. A positive learning from the pandemic was the swift action taken by governments to protect the health and well-being of citizens and by the global research community to develop a vaccine. It is not certain that a similar level of responsiveness can be mobilised to achieve a sustainable planet. However, with our Strategic Intent to 2030, TU Dublin is developing an agile structure to enable us respond to this global challenge.

In line with our transition plan, during 2021 a new University Executive Team (UET) was appointed to lead the University's transformation and strategic direction, including a Vice President for each pillar of the Strategic Intent – People, Planet and Partnership. Our new Education Model has also begun to take shape, underpinned by academic excellence and agility in adopting new approaches, pedagogies and technologies that enhance the quality of teaching and embed sustainability as a learning outcome.

A vital element in our student experience is the provision of top-class education facilities. Despite the challenges posed by COVID-19, in 2021 we opened five state-of-the-art buildings (80,000 m²) on our flagship campus at Grangegorman. Additional developments in progress include a multi-disciplinary Sports Science, Health and Recreation Centre on our Tallaght campus, additional teaching buildings in Blanchardstown, an Academic Hub + Library at Grangegorman, and our innovative Design + Construct initiative at Broombridge – for which over €4.5m of philanthropic support has been secured.

In advancing Equality, Diversity & Inclusion, the University developed its first Action Plan for an Intercultural University, with a focus on race equity. We also submitted our Athena Swan Application and Gender Action Plan, which was successful, and TU Dublin received its first institutional award - the Athena Swan Bronze Award.

Thankfully, 2021 was also a year of renewal as life slowly returned to normality. Now, as I write this message, I can see students arriving on campus for exams, colleagues greeting academic and industry partners, second-level students touring our new buildings, and the local community enjoying our campus grounds - representing the perfect microcosm of how a Technological University engages with the world outside our gates. Combined with our diverse educational offering and our thriving research and innovation community, it is these partnerships that will allow us to take to the global stage to address some of the pressing challenges facing our society. I hope you will continue to join us on our journey to *Create a Better World, Together!*


Professor David FitzPatrick
President



Executive Summary

This was a remarkable year, during which we all learned to live with the impact of the COVID pandemic. TU Dublin is proud to have been able to step up to the challenge, to continue to provide critical educational opportunities and to make a tangible impact on society, through research, innovation and engagement. Over 30,000 students enrolled with TU Dublin in 2021, across all levels and disciplines and over 8,000 students graduated successfully in the year.

The [TU Dublin Strategic Intent 2030](#) is the roadmap for the University's development. With a vision to 'Create a Better World Together' it centres around the three pillars of *People, Planet and Partnership*. This Annual Report reflects the activities undertaken and the advances made by the University throughout 2021, set out under the three pillars.

People

- TU Dublin continued development of its Education Model to fulfil its ambition of 'Nurturing Bright Minds, Creativity & Ambition'. Much was accomplished during the year in terms of creating transformational educational opportunities and delivering impact for learners, with a range of new programmes and initiatives launched to enhance learning, teaching and assessment practices. Some of the achievements of staff and students are highlighted.
- The provision of flexible and accessible educational opportunities is a feature of TU Dublin provision, with multiple entry points, progression pathways and flexibility in structure, mode and place of delivery, across programmes from NFQ levels 6-10. TU Dublin continues to be one of the largest providers of third level education in the country and is the largest provider of part-time education. In 2021, the University accounted for almost one fifth of enrolments in STEM nationally and was the largest provider of business education and apprenticeship education. We continue to support access to education, including those students with disabilities, mature students, students from socio-economic disadvantaged backgrounds and students from minority groups.
- To deliver on our ambition of 'Creating a Place of Imagination & Inspiration', a major phase of the Grangegorman Development Plan was completed, with five major buildings and over 80,000m² of state-of-the-art educational facilities. A new *Sports Science, Health & Recreation Building* also commenced construction on the Tallaght campus. The University continued to progress work on its *Equality, Diversity & Inclusion (EDI)* agenda, completing the application process for an Athena SWAN Bronze Award, which was subsequently achieved in March 2022.

- *'Championing a Passion to Excel'* is a focus for people development in TU Dublin. In 2021, a range of opportunities for both academic and professional services staff were provided, including leadership and professional development programmes, training in IT and programmes to support wellbeing and health. A range of training and development activities were also provided in pedagogy, programme design, assessment and feedback strategies, quality enhancement and technology-enhanced learning.
- Each year TU Dublin takes pride in the graduation of over 8,000 students. Whilst the pandemic provided some challenges in 2021, TU Dublin maintained engagement with its alumni and celebrated these key ambassadors of the University.

Planet

- TU Dublin aims to *'Be a Beacon for Sustainability'* and in 2021 continued to drive consciousness and understanding of sustainability through public discourse. This included work on the Green Flag Award for the University, hosting the launch of the *'Whole of Government Circular Economy Strategy'* and action on a range of projects to positively impact on the Sustainability Development Goals (SDGs).
- Several initiatives were undertaken to promote SDG literacy and embed sustainability in the curriculum, with the ambition to *'Create Responsible Global Citizens'*.
- The *'Tacking Global Challenges'* agenda has focussed on advancing the University's research priorities to create meaningful impact regionally, nationally and globally. During 2021, we succeeded in growing research awards and related outputs, building research and innovation capacity, and strengthening participation in national and European research programmes. A snapshot of the work of TU Dublin researchers across the disciplines is provided.



Partnership

- Open Science is the movement to make scientific research and its dissemination accessible. TU Dublin has engaged in open science for several years and has put in place a dedicated *Open Research Office*, the first in higher education in Ireland. In 2021, additional resources were allocated to this office, which has helped to drive the open science agenda. The University's open access facility, called 'Arrow', continues to be very successful, with over 11 million downloads in 2021.
- In 2021, TU Dublin continued to provide leadership in innovation and enterprise development, supporting knowledge transfer and new venture creation. Industry partners, researchers and entrepreneurs availed of the University's innovation services to access new technology licences, engage in R&D through Open Labs, or lead the development of new start-up companies - through support of the TU Dublin Hothouse commercialisation support services or the University's iVenture and New Frontiers enterprise development programmes. Over 100 companies were facilitated in the business incubators on the three University campuses. An exciting new initiative, GROWTHhub, was launched to complement the University's activity in this area. This project encourages an entrepreneurial mind-set amongst students, staff and partners, creating an environment of idea generation, exploration, and implementation.
- TU Dublin continued to strengthen engagement with external organisations and maintain 'A *Tightly Connected Network*' to help drive discovery, leverage synergies and deliver common goals. We developed new partnerships with a range of external stakeholder organisations, including enterprise and community, to achieve our goal of delivering shared impact.
- TU Dublin is committed to being a global technological university, collaborating with key strategic partners nationally and internationally to expand our reach, gain access to international practice and enhance our education and research capabilities. A key activity in 2021 was the further development of the European University of Technology (EUt+) Alliance, funded by the EU under the European Universities Initiative to help boost excellence in higher education, research and innovation, and facilitate seamless, transnational higher education opportunities for learners.
- '*Organisational Effectiveness*' is critically important for TU Dublin, established with the expectation of creating a new type of university in the Irish landscape. Major milestones were achieved in the roll-out of the Organisation Design project in 2021, including the appointment of a new University Executive Team (UET), which will lead the delivery of the TU Dublin Strategic Intent.

Section 4 of this report provides a summary and overview of the *Institutional Quality Review* process (CINNTE). All Irish higher education institutions are periodically reviewed by Quality and Qualifications Ireland (QQI), through a cyclical process known as CINNTE. As part of the process, TU Dublin completed a critical self-evaluation that was reviewed by an expert International Review Panel in September. Areas for enhancement of the TU Dublin Quality Framework were identified as part of the review process.

In the final sections of this report, we provide the University's *Equality, Diversity & Inclusion Statement* and the *Sustainability Statement*. In relation to governance, it is noted that Mr David Carson was appointed as Chair of the TU Dublin Governing Body in 2021. Details of the full membership and committees of Governing Body are provided. Academic Council membership is also provided. The University prepared its second set of Audited Financial Statements for the period to 31st August 2020 – a link is provided to the full statements.





TU Dublin at a Glance

Key Fact & Figures



3
campuses



30,000+
students



8,000+
part time students



2,500+
international students
from 140 countries



18%
STEM
% of national provision



14%
business
% of national provision



21%
services
% of national provision



24%
apprenticeships
% of national provision



**Award Winning
Staff**



1:17
Staff : Student Ratio



**Athena SWAN
Bronze Award**



8,000+
graduates per year



26%
of undergraduate
new entrants via
access routes



1,000+
academic
collaborations



800+
collaborations with
industry



1,000+
students working
with community
organisations



**EUROPEAN
UNIVERSITY OF
TECHNOLOGY**

Partner in the EUt+

Alliance of **8** European universities



**Award Winning
Technology
Transfer Activities**



7,000 m²
of incubation space



100+
start-ups p.a.
(facilitated on campus)



200
entrepreneurs p.a.
(on TU Dublin enterprise
programmes)



+75% in
research award value
(over the past 3 years)

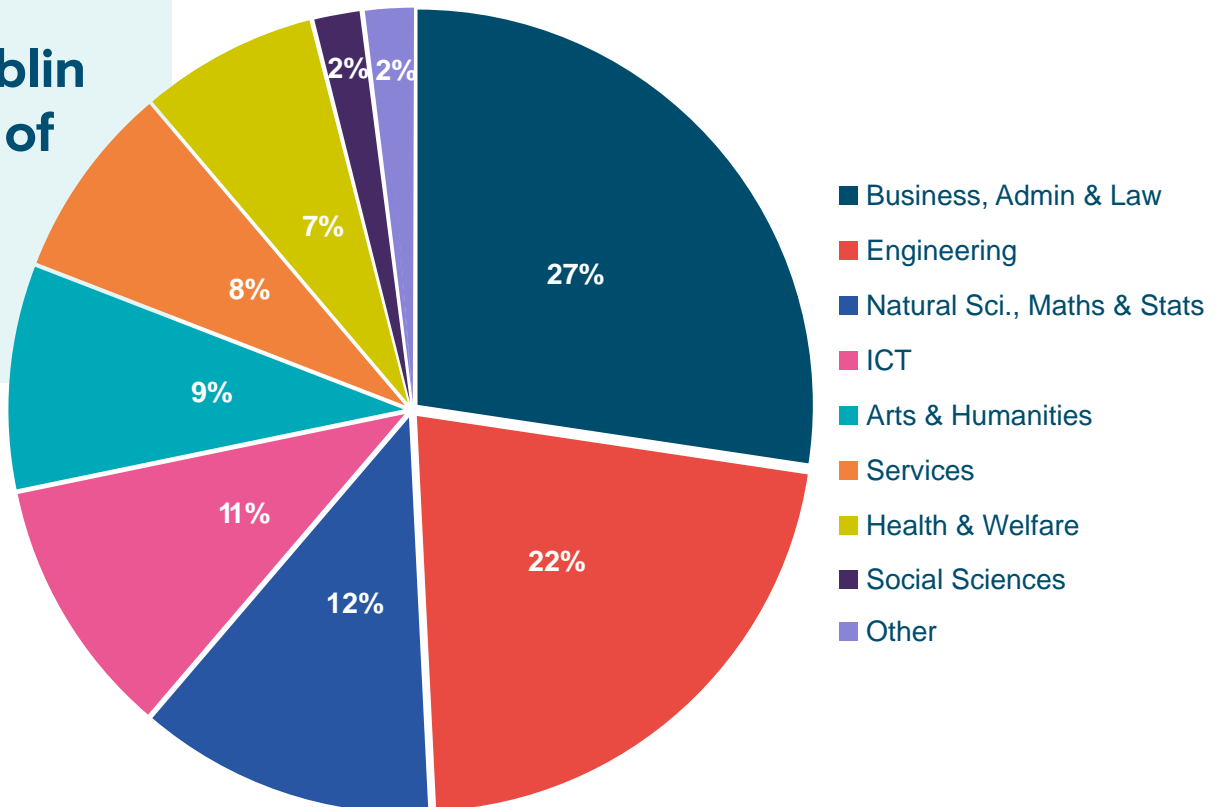


20,000+
citations
(in the past 5 years)



+11M
Open access research
downloads Arrow@TUDublin

**TU Dublin
Fields of
Study**



Strategic Intent 2030

Creating A Better World Together

Launched in January 2020, the TU Dublin Strategic Intent 2030 sets out an ambitious 10-year roadmap for Ireland’s first technological university. The vision is to ‘Create a Better World Together’, tackling the challenges facing us through the lens of the UN Sustainability Goals (SDGs). The Strategy comprises three key pillars - People, Planet and Partnership, underpinned by the key SDG ‘Quality Education’.



PEOPLE

We Will Foster Individual Talents In An Ever Changing World



PLANET

We Will Be A Powerhouse For Living & Breathing Sustainability



PARTNERSHIP

We Will Deliver Shared Impact

The strategy is focussed on:

- Completing the transformation of TU Dublin to become an internationally recognised high-performing technological university and championing a passion to excel amongst its people
- Offering quality higher education, through a new education model, that prepares graduates to be well-rounded, independent thinkers and lifelong learners with the aptitude to adapt to an ever-changing world, and
- Working closely with partners, through open innovation and a highly connected network, to deliver real change, innovation and positive impact for society and the planet.

Since its launch, significant work has been undertaken to progress the strategy. Initial focus has been on: -

- achieving the necessary cornerstones of infrastructure, organisation design and resources to meet the ambitions of a modern leading-edge university
- ensuring the unique academic offering of TU Dublin is maintained at a stable level and that students are supported to gain the best possible learning experience
- leveraging existing expertise in areas such as research and innovation to continue to create real impact in the world, in collaboration with the University’s stakeholders
- driving forward on important agendas such as Equality, Diversity & Inclusion (EDI) and Sustainability, that reflect the core mission and ethos of TU Dublin
- building solid foundations to enable the University create the transformational models set out in its vision

A new University Executive Team (UET) was established in 2021. Three Vice Presidents representing the three Pillars of the strategy – People, Planet, Partnership, are in place, along with a Vice President for Research & Innovation, Deputy President & Registrar, Chief Operations Officer and the Faculty Deans.

The University’s Strategic Planning Implementation Framework comprises key sponsors from the UET, implementation teams and action plans to drive implementation of each of the priority areas in the strategy, set out below. Whilst timelines have been affected by COVID, the strategy continues to be rolled out, with particular attention on key building blocks.

The progress of each priority is outlined in the subsequent chapters of the report.

PEOPLE
Nurturing Bright Minds, Creativity & Ambition
Pathways for All to Experience
Creating a Place of Imagination and Inspiration
Championing a Passion to Excel
Celebrating our Ambassadors

PLANET
Being a Beacon for Sustainability
Creating Responsible Global Citizens
Tackling Global Challenges

PARTNERSHIP
Open Science, Open Innovation, Open to the World
A Tightly Connected Network
Being Global
Organisational Effectiveness



People

1.1. PEOPLE: Nurturing Bright Minds, Creativity & Ambition

TU Dublin is committed to creating transformational educational opportunities that inspire, support and develop the individual in reaching their full potential.

A key strategic objective is to create a new University Education Model (UEM) that will build on TU Dublin's practice-based and research-led approach, embracing universal design appropriate for a hugely varied user base, many of whom will be operating in challenging circumstances. In an increasingly complex higher education landscape, deep understanding of the learners' needs, expectations and capabilities are key, along with the knowledge, ability and agility to adopt new approaches, new pedagogies, and new technologies that enhance the quality of teaching and learning.

In terms of student impact and transformational educational opportunities, a range of initiatives, innovations and activities were undertaken during 2021, examples of which are given.

Enhancing Learning, Teaching and Assessment

To meet our educational ambitions, the enhancement of learning, teaching and assessment is fundamental. An example is that of the TU Dublin Pharmacy Technician Studies Team, who achieved a Disciplinary Excellence in Learning, Teaching and Assessment (DELTA) Award in 2021 from the National Forum – a renewal of the award received in 2018. The DELTA Award is granted to discipline groups who demonstrate a record of excellence in teaching and learning enhancement. The TU Dublin team prepares students for the pharmacy technician profession in hospital/community pharmacy settings. They have implemented a three-year DELTA action plan under two overarching themes 'widening participation - diversity and transition' and 'high-impact and experiential learning activities'. The renewal of their Award in 2021 recognised the ongoing importance they place on quality, evidence-based enhancement of the curriculum.



National Forum's Disciplinary Excellence in Learning, Teaching and Assessment (DELTA)

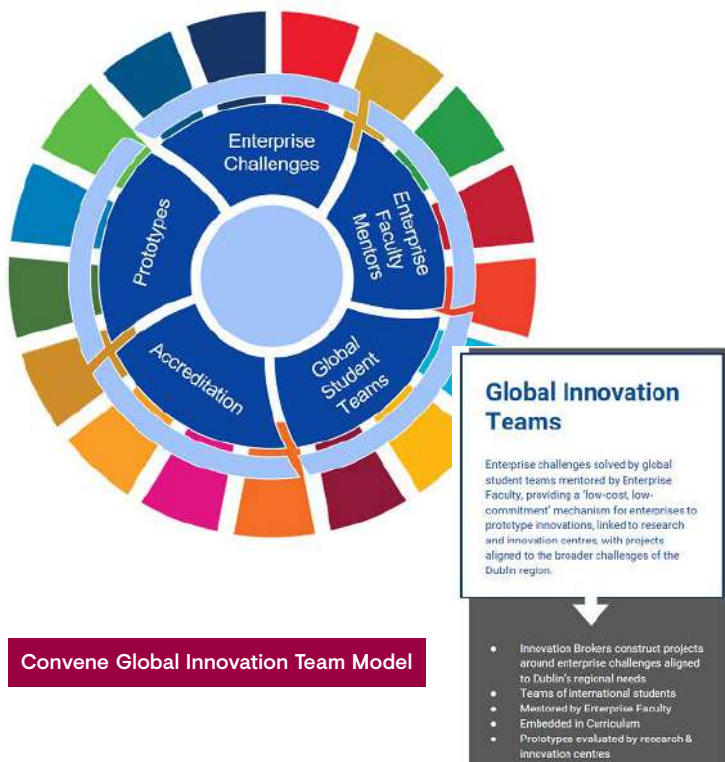
L-R: Dr Brendan Jennings (Vice President for Research and Innovation TU Dublin, representing the TU Dublin President), Dr Julie Dunne, Dr Lynn Ramsey (Chair, National Forum), Dr Gemma Kinsella, Dr Seána Hogan, Dr Tao Zhang and Tim Conlon (Head of Policy and Strategic Planning, HEA).

Innovation in pedagogy in TU Dublin is a continuous process and assessment had a particularly strong focus in 2021. Operation Authentic Assessment Transformation was a dynamic initiative that involved TU Dublin lecturers undertaking a re-design of module assessments, to nurture bright minds, stretch the student's understanding and enhance the learning experience. The work links to the [TU Dublin Authentic Assessment Framework](#), that supports programme teams in incorporating a diverse range of alternative approaches to assessment, focussed on the application of knowledge, the performance of exemplary tasks, or the measurement of students' abilities in scenarios that replicate 'real-world' challenges.

Learning How to Develop Solutions to Enterprise Challenges

CONVENE is an initiative funded under the Human Capital Initiative¹. A collaboration between TU Dublin and UCD, the project is intended to deliver the skills and innovation needed to rebuild Irish enterprise for a more sustainable and resilient post pandemic Ireland. Initial focus is on seven major employment sectors - ICT/FinTech, Tourism, Food & Drink, Creative & Cultural, Social Enterprise, MedTech and Pharma and there are 36 industry partners involved.

The CONVENE **Global Innovation Teams** initiative was launched in 2021 and is designed to encourage and empower students to develop solutions to enterprise challenges. Mentored by faculty members and enterprise partners, students are exposed to innovative technologies and supported by training in future-proofing skills such as innovation, digital competency, agility, creativity, teamwork, communications, and critical thinking. Simulating a student work-placement/internship, the prototype development and immersive project-based learning is awarded formal accreditation.



Convене Global Innovation Team Model

¹ <https://hea.ie/skills-engagement/human-capital-initiative/>

Recognising Student Achievement

TU Dublin is proud of the achievement of its students, many of whom received recognition from external bodies in 2021. One such student is Isabel Cooke, a student in Industrial Mathematics, who received a Hamilton Prize awarded by the Royal Irish Academy. Isabel is a very talented mathematician and a role model for future students and women thinking of pursuing mathematics.

The Hamilton Prize recognises outstanding young mathematicians as they enter their final year of studies in universities on the island of Ireland.

“Ireland has a rich history of scientific excellence and through this prize we also look to the future. In honouring their academic excellence and we hope to support encourage the next generation of great Irish scientists.”

Dr Mary Canning, President of the Royal Irish Academy.



Hamilton Prize Awards

Caroline Series FRS, Emeritus Professor of Mathematics, University of Warwick with TU Dublin Mathematics student Isabel Cooke

Enriching the Student Learning Experience through the Student Voice



An important element of academic work in TU Dublin is that of the ‘Student Voice’ – an element that fosters self-worth, engagement and purpose for students – and the University is focussed on supporting it to the greatest possible extent. In 2021, it continued to produce resources that facilitate the skills development of student class representatives, as well as the broader student population. It also provided academic staff with advice, guidance and access to best practice, with the objective of enhancing the student voice in quality assurance and quality enhancement processes. Resources are organised into a series of blocks and can be used in facilitated workshops.

New Programmes at the Forefront of Knowledge and Skills Development

TU Dublin continues to develop innovative programmes across the disciplines to address skills needs and shortages within the economy. They include: -

- The launch of an executive [MBA in Life Sciences Leadership](#), an exciting development in 2021 and the first of its kind in Ireland. The course is designed to enhance leadership capabilities in one of Ireland’s fast-growing sectors, with many of the world’s top life sciences companies now having bases around the country. The Executive MBA is hosted by the University’s Graduate Business School and School of Pharmaceutical and Chemical Sciences. The combination of business and life science modules delivered flexibly to busy working executives, provides a career development pathway for future leaders. The TU Dublin MBA is accredited by the Association of MBAs (AMBA).

- Recognising the exponential increase in the use of timber as a sustainable material, another of the new programmes launched in 2021 was [Sustainable Timber Technology](#), designed to educate timber technologists for the increasingly wide-ranging roles in the industry. It is projected that jobs in the sector will grow to 20,000 by 2030. The Programme is an immersive, four-year, full-time course that has a mix of theoretical and skills-based modules. Cross-disciplinary skills such as critical thinking, creativity, management, collaboration and professionalism complement the central focus on wood science, timber skills and production management. Prospective students are encouraged to join [Ireland’s Timber Technology Revolution!](#)



Infinite Possibilities

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Éireann Átha Cliath
TECHNOLOGICAL
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Developing Skills to Meet Employment Opportunities

Springboard+ is an upskilling initiative in higher education that offers free and subsidised programmes at certificate, degree and masters level leading to qualifications in areas where there are employment opportunities in the economy. In 2021, TU Dublin offered a total of 28 courses under this initiative in Architecture & Built Environment, Art, Design & Media, Business and Computing, IT & Maths, Engineering and Sciences. See further information [here](#).





Nurturing Talent - Facilitating Practice and Performance

Embodying international standards of excellence in the performing arts, TU Dublin Conservatoire supports gifted actors and musicians unlock their potential by providing outstanding artistic training grounded in craft, context and creativity. While shaping and enriching Ireland's culture, society and economy, it aims to create a lifelong community of exceptional performing artists, educators, researchers and cultural citizens.

After 113 years in Catham Row, the Conservatoire moved to [its new home](#) in Grangegorman in 2021. The top-class facilities available to all our students, from junior musicians to PhD students, makes an enormous difference to their development as artists and professional performers. A calendar of music and theatre performances is now in place to welcome supporters to the new performance spaces and enjoy the work of TU Dublin students and staff. See further information [here](#).



Nurturing Work-Based Skills

TU Dublin has supported students in a range of apprenticeship programmes for many years. In addition to the traditional ‘craft’ apprentices it also offers new generation programmes (NFQ levels 6–9) in areas such as Biopharma, CGI Technical Art, Logistics, and Telecommunications.

[Access to Apprenticeship](#) is an innovation from TU Dublin that supports the transition of young people (16–24 years old) from disadvantaged backgrounds into an apprenticeship scheme. The 12-week full-time programme gives the opportunity to sample a range of apprenticeships in Construction, Engineering, Electrical, Motor and Aviation industries, preparation of the student’s CV, interview skills and work experience.

In 2021, TU Dublin launched its ‘Digital Badge Award’ for employers involved in the programme. The Digital Badge acknowledges the support the companies provide to the Access to Apprenticeship programme and its mission to promote access, diversity and inclusion in craft apprenticeships. Thirty companies from across the construction, motor, aviation, manufacturing, engineering and electrical industries were recognised in 2021 for their contribution to this successful work-based skills programme.





Nurturing Ambition – Supporting a New Generation of Irish Sportspeople

TU Dublin aims to facilitate sporting excellence through the development of an environment in which students can excel and realise their full potential in both sport and education, as well as making a positive impact on the future of Irish Sport.

Sean Waddilove with his teammate Robert Dickson
Photo by: Sailing Energy / Lanzarote International Regatta

- In 2021, a scholarship agreement between TU Dublin and the Gaelic Players Association (GPA) was established to provide elite student-athletes with a holistic package of athlete-led supports. Wicklow hurler Peter Keane (*post-graduate student in Management and Marketing*) and Tipperary hurler Patrick Maher (*post-graduate in student in Strategic Management*) were the first TU Dublin students to benefit from this scholarship agreement.
- The [TU Dublin Athletes Support Programme](#) is a dedicated initiative for talented young athletes. TU Dublin is proud of the achievement of four of the students supported under this programme who competed in the Olympics and Paralympics in 2021: -
 - Oliver Dingley (student in Film & Broadcasting) - Olympic diver and competes in 3m springboard
 - Ellen Keane (student in Culinary Entrepreneurship) - Paralympic swimmer and competes in S9, SM9 and SB8 classification events
 - Patrick Monahan (student in Applied Social Studies) - Paralympic athlete and competes in wheelchair marathon event
 - Sean Waddilove (student in Sports Management & Coaching) - Olympic sailor and competes in 49er event

“There is no other programme I would put my trust in than TU Dublin’s Athlete Support Programme to run a successful Olympic campaign alongside my academic studies. Having everything you need to run an Olympic campaign under the one roof pays tribute to TU Dublin’s attitude towards ensuring athletes reach their full potential.”

1.2. PEOPLE: Pathways for All to Experience

TU Dublin is creating educational opportunities that inspire, support and develop the individual in reaching their full potential and is committed to providing and promoting multiple entry points, clear progression pathways, ensuring flexibility in structure, mode and place of delivery to suit an evolving landscape.

TU Dublin continues to be one of the largest providers of third level education in the country, educating the largest number of Irish students nationally². In 2020/21, we enrolled over 30,000 students, across all disciplines, including apprenticeships, overseas students and junior music and at all levels from NFQ 6 to 10 (Figure 1).

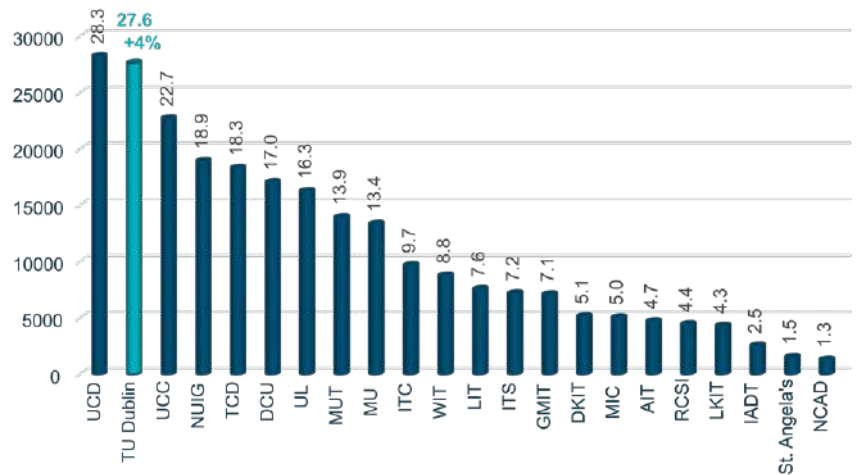


Figure 1: Student Enrolments by HEIs Nationally 2020/21 (HEA Data)

Fields of Study

In line with a profile of a technological university, STEM fields (Science, Technology, Engineering and Mathematics) account for nearly half of TU Dublin's enrolments (Figure 2) and almost one fifth of all national enrolments. We are the largest provider of Business (educating almost one third of business students in the Dublin region) and have a strong presence in the Creative, Music & Performing Arts (with almost 40% of these students in the Dublin region). TU Dublin also accounts for over 20% of national enrolments in Services, including the Hospitality field.

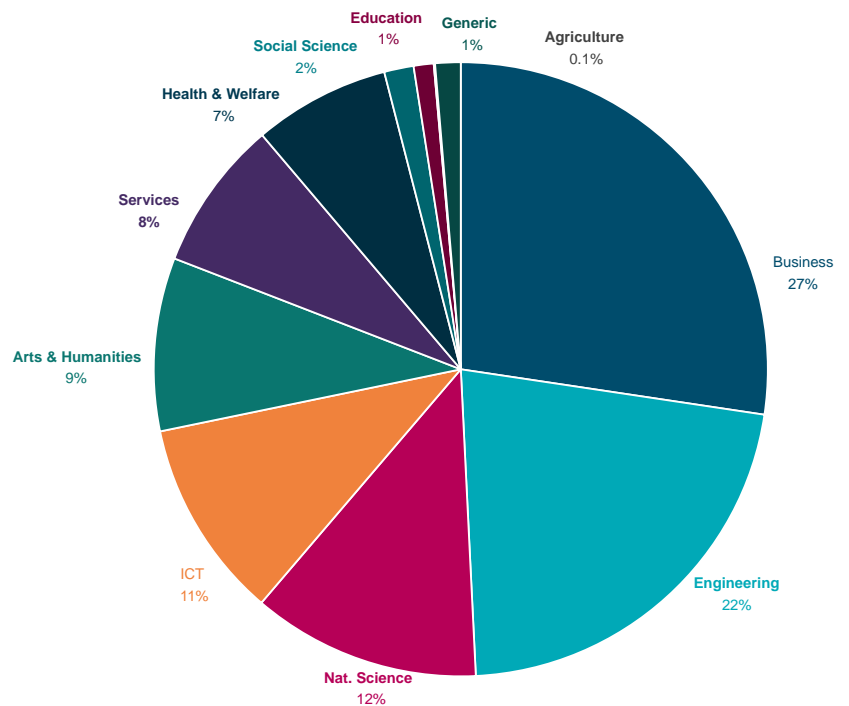


Figure 2: TU Dublin Student Enrolments by ISCED 2020/21

Part Time Education

TU Dublin is the largest provider of part-time education (Figure 3) accounting for almost one fifth of all part-time students nationally. Level 6 and 7 accounts for 40% of TU Dublin’s part-time enrolments. These programmes provide critical entry points for those who may not have had access to higher education in the past. Postgraduate enrolments make up over a third of TU Dublin’s part-time cohort.

Flexible enrolments (which includes part-time learners, distance and e-learning education, Springboard and CPD learners) increased to almost 9,500 in 2020/21 and accounts for 33% of total enrolments. The average for HEIs nationally is 23%.

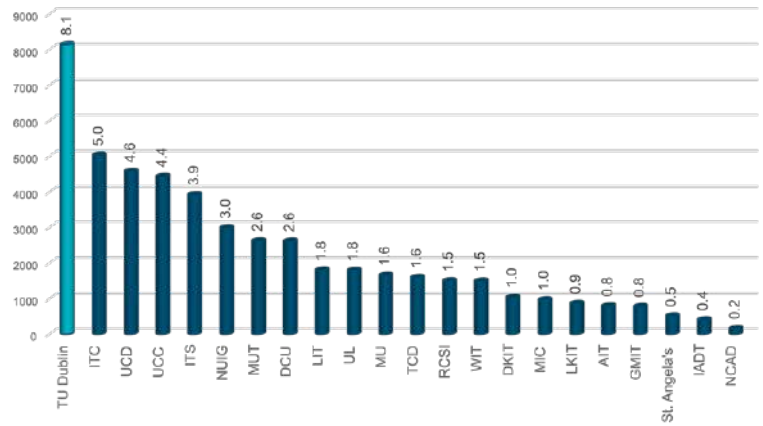


Figure 3: Part-Time Student Enrolments by HEIs Nationally 2020/21 (HEA Data)

Apprenticeships

TU Dublin continues to be a significant provider of traditional craft apprenticeship, delivering almost a quarter of the national provision (Figure 4). An increasing feature in the portfolio is ‘New Apprenticeships’, with almost 250 apprenticeships registered in 2020/21.

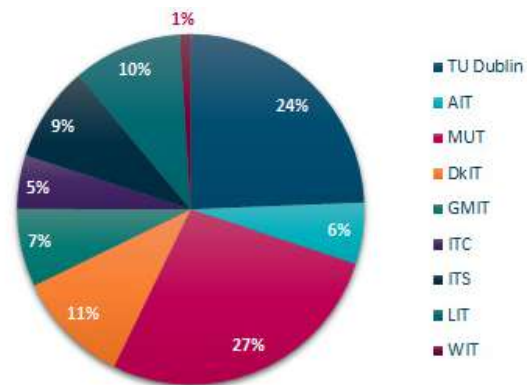


Figure 4: Traditional Craft Apprenticeship Enrolments by HEIs Nationally 2020/21

Widening Participation

TU Dublin continues to maintain its position nationally as a leader in ‘widening participation’ in education (Table 1). Widening participation embraces full-time students, traditionally known as ‘access’ students, including students with disabilities, mature students, students from socio-economic disadvantaged backgrounds and students from the Traveller community.

New Entrants	TU Dublin Enrolments 2020/21	% of National Provision
Mature Students	334	11%
Socio-economically Disadvantaged Backgrounds	2,895	14%
Students with Disabilities	1,721	11%
Irish Traveller	11	9%

Table 1: TU Dublin’s Access Student Enrolments as a % of National Enrolments 2020/21

1.3. PEOPLE: Creating a Place of Imagination & Inspiration

To deliver on this ambition to ‘Create a Place of Imagination & Inspiration’, TU Dublin is focused on two elements – the Equality, Diversity & Inclusion agenda and implementation of its Campus Development plans.

Equality, Diversity and Inclusion (EDI)

EDI is an integral part of TU Dublin and the University has set itself an ambitious goal to be an exemplar in the field. TU Dublin’s formal Equality Statement is set out in Section 5 of this report and during 2021, it made significant strides towards its overall goal.

A major element of work has been the [Athena Swan initiative](#). Athena SWAN is a framework and accreditation scheme that recognises and celebrates good practices towards the advancement of gender equality in Higher Education, in terms of representation, progression and success. Critical work of preparing an Athena Swan Application and Gender Action Plan was completed in 2021. This has led subsequently (March 2022) to the achievement of an [Athena SWAN Bronze Award for TU Dublin](#) in recognition of its commitment to advancing gender equality and the University’s plans to address systemic inequality.



In addition, TU Dublin has had a series of initiatives and activities throughout the year supporting the University’s EDI aims. They include: -

- [RINCE](#): AIB Research Centre on Inclusive and Equitable Cultures – has been involved in several research projects, including a Horizon 2020 project designed to build networks, exchange knowledge and engage best practices to stimulate the integration of the Sex and Gender Dimension in Research Content (SGDRC).
- The *Senior Academic Leadership Initiative (SALI)*, an Irish government programme, to accelerate progress in achieving gender balance at the senior academic level in HEIs. From the outcome of the second cycle of SALI, TU Dublin was awarded a third post, ‘Professor of Innovation and Sustainability in Engineering, Construction and Built Environment’, to add to the previous two posts - ‘Professorship in Inclusive Computer Science’ and ‘Professor of Public Trust in the Media, Arts and Technology’. These posts are important in bringing about systemic structural change and embedding a culture of gender equality.
- Promoting Consent and Ending Sexual Violence and Harassment Framework (PCESVH) - the University’s Action Plan in this area was completed in February 2021. It sets out TU Dublin’s commitment to uphold the right to learn, work and socialise in an environment free from sexual discrimination, harassment and violence.
- [TechMate](#) - funded by HEA’s Gender Equality Enhancement Fund, this project aims to develop a new toolkit of best practice techniques and methods for recruiting and retaining female students on technology-focused programmes, where under-representation continues to be a problem.

Campus Development Plans

Critical to the student experience is the quality of the physical learning environment and campus facilities. The TU Dublin masterplan, involving over 200,000 m² of new campus space over its three locations (City Campus Grangegorman, Tallaght and Blanchardstown), is the largest infrastructural development in Irish Higher Education and a priority in the National Development Plan. During 2021, COVID-19 caused severe disruption to construction, requiring amendments to original schedules. But despite these challenges, significant progress was achieved.

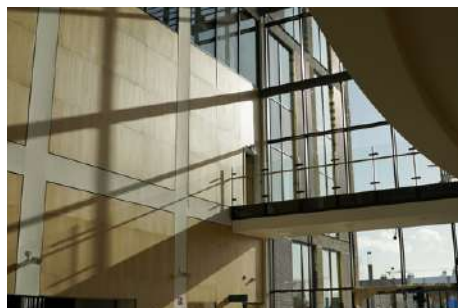
The Sports Science, Health & Recreation Building on the Tallaght campus commenced construction, with completion expected in 2022. Following some delays, planning permission was also secured for a 5,000m² multi-disciplinary building (Tallaght) and a 4,000m² general teaching building (Blanchardstown) as part of the HEPPP (Bundle 1) package. Contracts with the preferred tenderer are expected to close in 2022 and construction to commence thereafter.



Figure 5: Grangegorman campus – Development Programmes

The most significant achievement in the period is the delivery of five major buildings (c.80,000m²) on the Grangegorman campus, as part of the planned Development Programmes for the campus (Figure 5). 10,000 students are now accommodated in superb state-of-the-art learning facilities.

- o **The East Quad** (opened 2020) is home to TU Dublin’s creative and performing Arts disciplines. Along with its suite of classrooms, workshops, studios, and informal learning spaces, East Quad boasts a 400 seat Concert Hall, a Black Box theatre and Recital Hall.



- **The Central Quad** (opened 2021) is home to the Science disciplines, Culinary Arts, Hospitality and Electronic Engineering. The inner courtyard maintains the mature cherry tree that has been growing there for many decades! The Central Quad features the 250 seat Intel Theatre along with a range of other smaller teaching spaces and informal learning areas. It also has a range of top-class laboratory spaces and technical areas catering to a wide range of disciplines. The building has been designed to be welcoming and inclusive, with large, glazed ceilings allowing light to pour into the building. In the main atrium, a stunning work of art by Alexandra Carr stretches to nearly the full height of the building.
- **The Lower House**, the oldest building on campus, was brought back into use and opened in early 2021. It houses a large dining area, as well as the Student Union facilities, a dance studio and indoor sports areas. There are also 18 music practice rooms complementing facilities in the East Quad. It is linked by a beautifully landscaped walkway to the East Quad.
- **Rathdown House** houses a large restaurant and a one-stop-shop for Student Services, including a Health Centre and Counselling Services.
- **Park House** is home to our temporary library, in place until the completion of the Academic Hub. It also houses the Academic Writing Centre, Careers Development Centre, Disability Support Centre, and the Maths Learning Centre, along with Professional Services offices.

Through ergonomic and universal design principles, the buildings and public realm spaces create an inviting and inspiring atmosphere that will have hugely positive effects on learning and wellbeing for students, as well as staff, industry partners and local community. Along with traditional lecture rooms, seminar spaces and labs, smaller, flexible spaces are available encouraging knowledge-sharing, collaboration and the facilitation of project work. There are also convenient, comfortable, and quiet places where students can focus on studying, along with areas for informal and online learning.

The remaining Development Programmes continue to progress and will benefit future generations of students. Projects currently in development are: -

- **The Academic Hub** - Preparatory work has been completed, with construction commencing in February 2022.
- **West Quad** - Planning permission was secured in 2019. Delayed due to COVID, but preparatory work is resuming in 2022.
- **Broombridge** - Progress is continuing on this development, where the University's 'Design & Construct' initiative will be located. Significant philanthropic support has been secured to date for this innovative centre.
- **FOCAS** - involving the relocation and extension of this research facility. Initial planning work has been undertaken and a procurement competition is in preparation.

The University's Campus Development Plans express our commitment to sustainability.

- In 2021, TU Dublin and *Geological Surveys Ireland (GSI)* embarked on an exploratory project to drill the first urban geothermal test hole in Ireland (of 1,000m). Results indicate the geothermal's real potential in this area. The next step is to plan for the construction of Ireland's first Geothermal District heating system in Grangegorman.
- Additionally, TU Dublin is partaking in the District Heating Scheme in Tallaght. Launched in June 2021, it will operate as Ireland's first not-for-profit heat utility. The scheme transfers excess carbon heat to buildings connected to the system and will reduce carbon emissions in the area, with annual savings of almost 1,500 tonnes of CO₂ in its first phase. The nearby Amazon data centre will provide the initial source of heat on the network. Phase one connects South Dublin County Council's office headquarters and the TU Dublin Tallaght campus.

1.4. PEOPLE: Championing a Passion to Excel

During 2021, a range of programmes and workshops were provided to underpin the development of staff and support our strategic values of excellence, impact and inclusion. The priorities were to develop the capabilities required to deliver the TU Dublin organisational design and transformation and support ongoing delivery of our strategy. Almost 600 training and development programmes were delivered, involving over 11,000 participants.

Supporting Staff in a Time of Change

As TU Dublin is undergoing a major structural, cultural and physical transformation, leadership and change management workshops were delivered. In addition, workshops such as ‘Preparing for Interview’ facilitated staff for career development opportunities emerging from the new organisation design. In line with the University’s EDI strategy, twenty female staff attended the Aurora Leadership Programme to develop leadership capability and an understanding of the issues facing women’s career progression in Higher Education. To support staff during the pandemic, there was a significant focus on wellbeing and health promotion. In addition, remote working was supported through the delivery of live webinar training and online courses.

Learning, Teaching and Assessment in an Online Environment

Academic staff benefitted from professional development opportunities offered by the TU Dublin Learning, Teaching and Technology Centre (L TTC) in pedagogy, programme design, assessment and feedback strategies, and technology-enhanced learning, including the Virtual Learning Environments. A range of postgraduate and CPD programmes for staff was also provided, including the MSc/Postgraduate Diploma in Education and a Post-Graduate Certificate in University Learning and Teaching.

With staff predominantly working remotely, an emphasis was maintained on developing effective strategies to engage and support student learning online, supporting technologies such as polling software and video-editing, as well as new web-based multimedia guides for staff. External and internal funding enabled additional support for the development of digital and Universal Design skills amongst staff. New initiatives such as ‘Communities of Practice’ to support the exchange of knowledge and showcase events on academic matters have been established.





1.5. PEOPLE: Celebrating our Ambassadors

TU Dublin is proud to graduate almost 8,000 students annually, providing a strong talent pipeline responsive to the needs of enterprise, public service and community sectors and, in particular, in the Engineering, Sciences and Technology sectors (Figure 6). Graduates are very successful following graduation with high employment levels and engagement in further study, and there are many well-known TU Dublin alumni³.

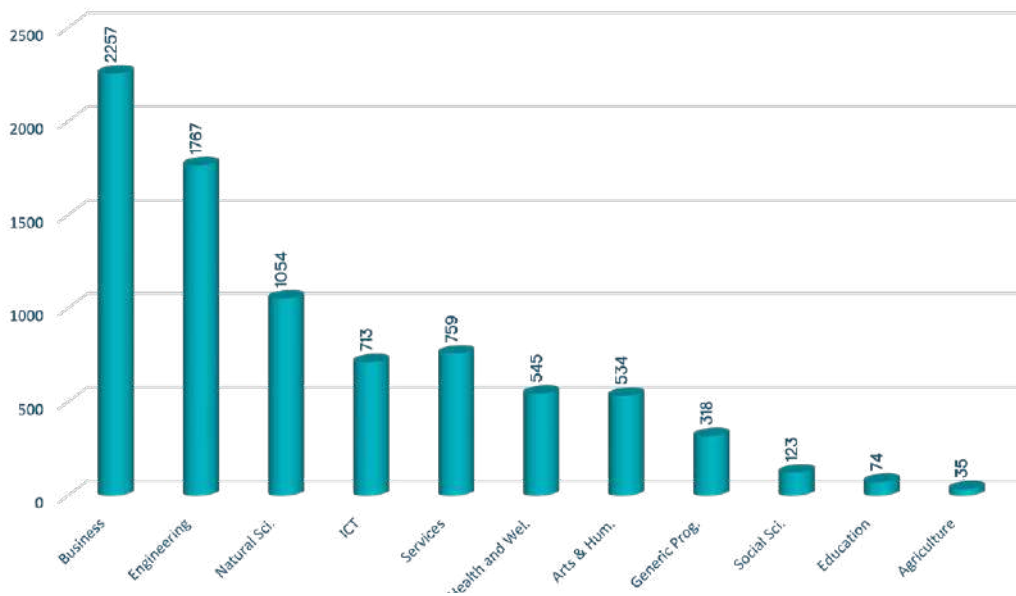


Figure 6: TU Dublin Graduates by ISCED 2020/21

With nearly 150,000 graduates registered to stay connected with TU Dublin, the Alumni community was far reaching and better connected than ever in 2021. Their success stories are countless and some of interest are highlighted.

³ <https://www.tudublin.ie/connect/graduates/notable-alumni/>



Adrian Lawlor (BSc Marketing and Management, Class of 2001), was appointed Group Chief Marketing Officer at Kepak in July 2021. This role, in addition to his previous responsibilities overseeing insight, innovation, marketing and business planning for *Kepak's Foods Division*, sees Adrian assuming responsibility for leading the marketing function of the Meat Division at Kepak.



Jessica McCarthy (MSc Computer Science, Class of 2009), was appointed Senior Director of Engineering-Network Infrastructure (SRE) at Google in February 2021 and now leads the 700-strong team of engineers at Google in Ireland. The author of several scientific papers, Jessica holds several patents in the field of IoT, service orchestration and information centric networking. She also leads the Google Generation Scholarship, which was established to help aspiring computer scientists excel in technology. She chairs the Irish chapter of women in big data (WiBD).



Ellen Keane (BSc in Culinary Entrepreneurship, Class of 2018), Paralympic champion, pictured here after winning the gold medal in the SB8 100m Breaststroke final at the Tokyo Paralympics in August 2021. This was Ellen's fourth Games appearance since making her debut as Ireland's youngest ever athlete when she swam in Beijing in 2008.



Clodagh Lavelle (Fine Art Graduate, Class of 2003), pictured here with Array Collective, a group of activist artists from Belfast, after winning the Turner Prize in December 2021. The jury awarded Array Collective for the way they "were able to translate their activism and values into the gallery environment, creating a welcoming, immersive and surprising exhibition."



Caitriona Balfe (Drama Graduate, Class of 1998) received widespread critical acclaim for her role in Kenneth Branagh's film 'Belfast' in 2021. Receiving numerous individual award nominations, including Golden Globe, BAFTA and IFTA nominations for Best Supporting Actress, she also picked up a Hollywood Critics Association Award for Best Ensemble Cast.



Ahmet Dede (Higher Cert. in Professional Cookery, Class of 2012), Owner and Chef at Dede in Baltimore, Co. Cork received a Michelin star in January 2021. Ahmet was awarded his first Michelin star at Mews. Previously, he worked at some of Ireland and Europe's top restaurants, including Chapter One, Restaurant Patrick Guilbaud, &Moshik, and with Mickael Viljanen at The Greenhouse and Norway's Maaemo.



Siân Cunningham (BA in Law, Class of 2006), was appointed CEO of Crash Ensemble in April 2021, a new Irish ensemble of world-class musicians, playing adventurous, ground-breaking music. Siân has over 20 years' experience working in the arts in Ireland, initially with the Arts Council and she held the roles of General Manager with Dance Ireland, Managing Director with the Dublin International Film Festival and most recently General Manager with Body & Soul.

Infinite Possibilities



Planet

2.1. PLANET: Being a Beacon for Sustainability

In 2021, TU Dublin continued to progress the [Seven Step programme](#) required to achieve a Green Flag Award by 2023 and is committed to showcasing the University as a living lab. The appointment of a Vice President for Sustainability indicates the commitment to this ambition. To drive consciousness and understanding on sustainability in wider society, the University is collaborating with stakeholders to share its expertise to inform action and encourage public discourse.

In December, TU Dublin welcomed Minister of State, Ossian Smyth TD, for the launch of Ireland's first *Whole of Government Circular Economy Strategy*. During the launch TU Dublin showcased three projects as examples of the circular economy in action:-

- **Rethinking** building construction at pre-design stage for all new campus buildings
 - a multi-disciplinary design team appointed for the TU Dublin's FOCAS research institute is working to ambitious design targets in response to the climate crisis, that will reduce material needed, waste generated and carbon expended in this new facility.
- **Repurposing** recycled plastics for good - [3D Assist](#) has printed over 60 hands and arms for children with limb differences. The devices are printed using a corn-derived bio-plastic that are easily recycled.
- **Reducing** reliance on fossil fuels by creating renewable energy sources - TU Dublin is working with Geological Surveys Ireland to develop a geothermal-based district heating system at Grangegorman.

Launched in 2021, TU Dublin will host [Walk21 Ireland](#) in partnership with three government departments who have committed €750K towards the event. The event will bring leading politicians, environmental experts, not-for-profit organisations and community activists to Dublin in September 2022. The conference will celebrate the values of walking and showcase innovative solutions to deliver on climate change targets and address the climate emergency.



Minister of State for Public Health and Wellbeing, Frank Feighan T.D. on a morning walk in TU Dublin Campus with children from Dublin 7 Educate Together National School to promote Walk21 Ireland.



3D Assist manufactured prosthetics bio-plastic arm

To stimulate public awareness on sustainability, TU Dublin contributed to [RTE Brainstorm](#). Some articles published in 2021 included:-

- [6 Ways to Reduce Food Waste in your Home;](#)
- [4 Steps to Make Dublin a Better Walking City;](#)
- [How Ireland Can Rethink its Approach to School Meals and Food Education; and](#)
- [Why it's Time to Face Up to the Climate Change Cost of Culture.](#)



RTE Brainstorm

[How to Turn Shellfish Waste into Bioplastics](#)

Each year as much as 60 container ships of left-over material from crab and shrimp production in Europe goes to landfill or incinerators. However, crustaceans produce chitin, a useful substance that when treated becomes a mouldable, durable and chemically resistant and is totally biodegradable. This source of bio-plastic is used for the circular economy, which is currently being investigated by TU Dublin researchers.

RTE Brainstorm

[Next-day Delivery Carbon Footprint](#)

PhD student, Xu Sabrina Zhang, whose research focuses on the development of an indicator framework to measure the emissions of city logistics, investigated the carbon footprint of our online deliveries.

COVID-19 saw an unprecedented increase in online purchases. Online shopping increased by 72% across the EU and 91% in the UK. In Ireland, in the height of the pandemic, An Post reported 3.3 million parcels delivered each week, a 230% increase on the previous year. When compared with traditional in-store shopping, the carbon emission for online shopping can be four times higher.

The article encourages us as consumers to be mindful of our potential impact on climate change, as we make our every-day choices.



2.2. PLANET: Creating Responsible Global Citizens

TU Dublin's objective is that by 2023 all programmes will have sustainability as a learning outcome, providing education that instils a sustainability mind-set and creates champions to drive the sustainability agenda.

To support this objective three related learning and teaching initiatives were implemented to:- (i) promote sustainability literacy; (ii) provide education for sustainability to staff through CPDs; and (iii) embed sustainability in the curriculum.



(i) SDG Literacy

TU Dublin's student participation in [Sulitest](#), a UN on-line literacy tool developed under the Higher Education Sustainability Initiative (HESI), increased threefold in 2021. With the help of seed funding, a university-wide community of practice on sustainability literacy was established. It is now extending sector-wide, with a regional national expert committee being formed, in collaboration with staff from GMIT, NUI Galway, DCU and UCC, to focus on developing a module within Sulitest specific to Ireland. TU Dublin staff have been invited to become fellows for developing a *Sulitest International Certificate on Sustainable Development* that will massify its impact and contribute to the sustainability literacy movement.

(ii) Staff Training/CPD in Educating for Sustainability

TU Dublin launched a series of professional development activities on sustainability as a basis for curricular enhancement. For example, the School of Food Science and Environmental Health piloted an NQF L9 five credit module, *Educating for Food Sustainability*, for staff and post-graduate students in 2020/21. The delivery model was supported by peer-learning, co-create workshops and invited industry experts. This pilot module is being adopted and adapted across the University as appropriate and it is expected that over 80 academic staff will have completed this CPD and be positioned to embed sustainability learning in their courses and programmes.

(iii) Evaluating the Embeddedness of Sustainability in the Curriculum

Whilst several frameworks exist to evaluate sustainability in the curriculum, [AASHE-STARS](#) has become among the most widely adopted. In 2021, TU Dublin conducted an initiative that assesses the SDGs in the curriculum and categorises it according to the AASHE-STARS criteria. The first programme evaluated under this framework was the *BSc in Sustainable Timer Technology*, which was launched in September 2021.

Other Curriculum Initiatives

- To support our ambition, other initiatives undertaken included the development of a module on Active Citizenship - a five-credit, generic module that can be included for any programme or discipline. The module encourages students to find creative and innovative ways to exert their responsibilities in addressing the broader challenges facing society and consider how the future is shaped. It is framed against the UN SDGs and the [Council of Europe Reference Framework of Competences for Democratic Culture \(RFCDC\)](#).
- Another module, *Global Citizenship in the Workplace*, was also launched - focused on global citizenship and addressing issues such as sustainability, social innovation, social enterprise, regenerative approaches and cultural intelligence. Participants work on an industry challenge and the module supports and frames their thinking as they address that challenge.
- Sustainability poses what are described as 'super-wicked problems', in which learning and problem-solving is transformative and transdisciplinary. It necessitates organising teaching and learning in the context of real-world problems or themes and to work on projects jointly with other disciplines. Key initiatives were undertaken during 2021 addressing challenges such as: green transition in forestry, food waste, biodiversity, sustainable fashion, flood projects, climate action, air quality, sustainable tourism, and food inequality.

TU Dublin Green Campus

The [Green Campus](#) Programme encourages a partnership approach to environmental education, management and action in third level institutions. The Programme primarily aims to ensure that members of a campus community can engage in a meaningful way to enhance sustainability on campus. In TU Dublin, the Green Campus Committee, comprising staff and students, hosted its tenth [Green Week](#) in 2021 – a series of events championing innovation and partnership relating to sustainability. It also provided a chance to debate ideas and showcase TU Dublin as a living lab for environmental sustainability and deliver biodiversity projects on campus. Events covered a range of topics including - Sustainable Fashion, Flood Projects with the OPW, Green Transition in the Forest Industry with Coillte, Sustainable and Healthy Diets with City University London, and the Future for Irish Towns. Further information on the impact of TU Dublin on sustainability initiatives during 2021 is detailed in the [TU Dublin UN Sustainability Goals Progress Report](#).

2.3. PLANET: Tackling Global Challenges

TU Dublin is a globally engaged, research-informed university, applying innovation and technology to solve the most pressing challenges facing business, industry, and society. TU Dublin has the expertise, techniques and facilities that support several targeted research areas, delivering results that have impact regionally, nationally and globally. Research is conducted through our **Research Institutes, Centres and Groups**, that operate across a range of fields - details can be found at the following [link](#). The University also hosts two Technology Gateways (supported by Enterprise Ireland):- [CREST](#) and [MiCRA](#) and is a partner in a number of SFI Research Centres:- [ADAPT](#), [Connect](#) and [MaREI](#).

Through its foundation period, TU Dublin has been focused on building its research capacity and capability in scale and international recognition. Research publication outputs (as per the [Scopus](#) database) is provided below in Figure 7. The Sustainable Development Goals (SDGs) provide the key backdrop for TU Dublin's Strategic Intent. The largest representations in research publications fall within SDG 3 Health & Wellbeing, SDG 7 Affordable & Clean Energy and SDG 4 Quality Education.

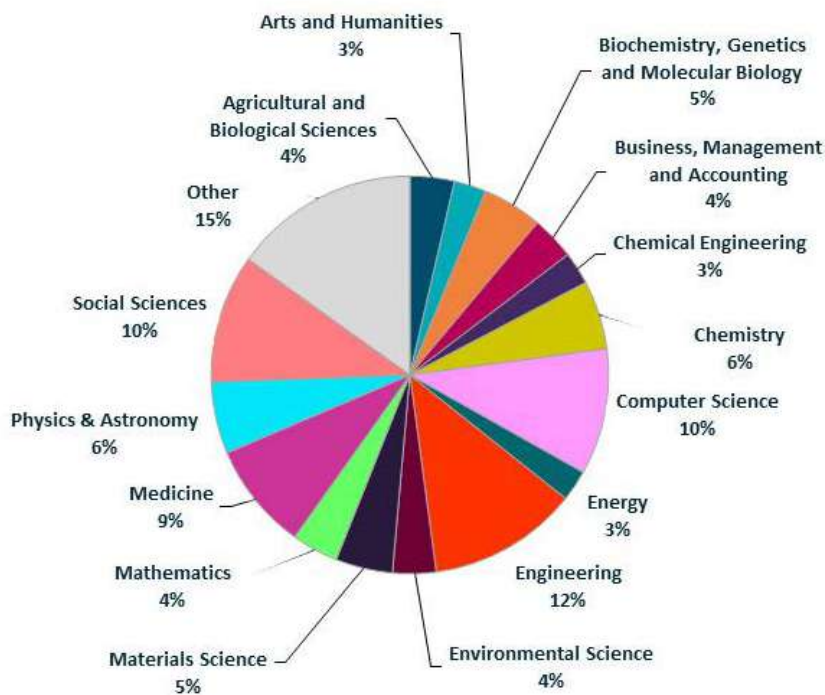


Figure 7: TU Dublin Scholarly Outputs - Publications 2019-2021

In general, areas of strength lie in the publication areas of Engineering; Natural Sciences; Computer Science and Social Sciences. However, it is recognised that scholarly work in the creative and performing arts, a significant provision in TU Dublin, is not readily captured in Scopus system.

Externally funded research awards, by field of study (ISCED⁴) and by funding agency, respectively, are provided in Figure 8. TU Dublin has experienced growth in all areas, leading to an overall growth of 75% in research awards since 2019, totalling over €20M in 2021.

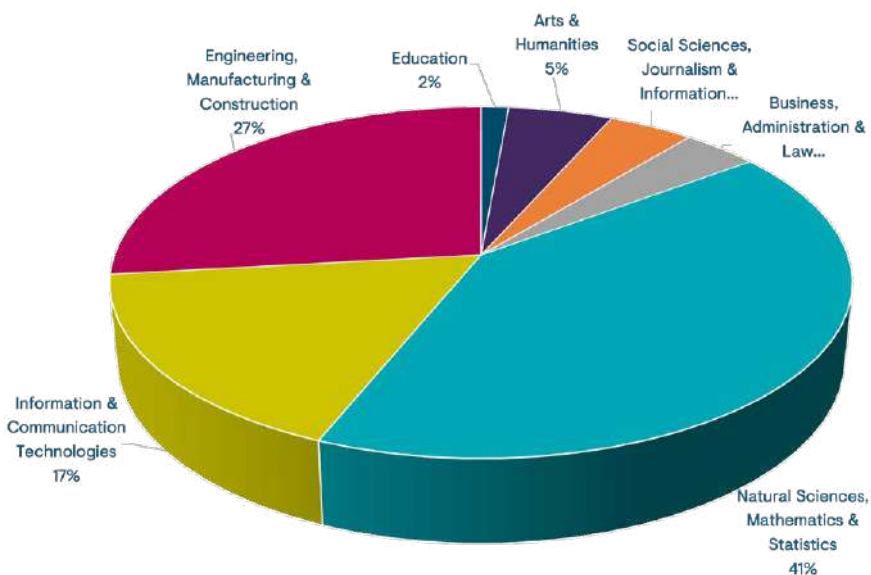


Figure 8: % of TU Dublin Research Awards 2021, by ISCED Field

Regarding sources of awards, TU Dublin continues to diversify and grow its funding across a range of national and European research agencies (Table 2). There is strong growth in funds from the Irish Research Council and from EU funded programmes and Science Foundation Ireland, where the total absolute value is highest. The success in research awards includes a focus on higher value awards per application.

	2021 (€000's)	% Change in the period 2019-2021
Dept Agriculture, Food & the Marine	266	-51%
Environmental Protection Agency	291	-51%
European Commission	3,381	185%
Enterprise Ireland	2,992	25%
Higher Education Authority	33	-96%
Irish Research Council	2,655	366%
Industry	1,156	63%
Science Foundation Ireland	4,705	56%
Other	5,093	110%
Totals	20,571	75%

Table 2: TU Dublin Research Awards 2019 -2021, by Funding Agency

Through the organisation design process, TU Dublin is consolidating and refocussing its research support services towards prioritising areas of strength. These structures will facilitate the development and implementation of strategy; promoting and enabling a step change in the quality, volume and impact of the research; and ensuring effective partnerships with national and international funders and partners.

4 [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_Standard_Classification_of_Education_\(ISCED\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=International_Standard_Classification_of_Education_(ISCED))

ALEHOOP

Current protein sources are becoming unsustainable from an economic and environmental perspective. Moreover, demand for alternative low-cost substitutes is increasing in the food and agricultural sectors. [ALEHOOP](#), a collaborative project funded under European Union's Horizon 2020, aims to address these challenges by extracting low-cost dietary proteins from algae-based and plant residual biomass. This is done using macroalgae and legume-based bio-refineries. The resulting proteins could be used in human food, including healthy snack bars, sports drinks and meat substitutes, and animal feed for chickens, pigs and fish.



The TU Dublin research team provided a demonstration to EC President, Ursula von der Leyen and Taoiseach, Micheál Martin TD during their visit to Grangegorman

Further details [here](#). This is one of a number of research projects lead by [Dr Catherine Barry-Ryan](#), Co-ordinator and Principal Investigator at the University's [Food Innovation Lab](#).

RESC

In 2021, an article originally published by CORDIS⁵, highlighted the success achieved by the [Centre for Radiation and Environmental Science \(RESC\)](#) in the area of 'Raman spectroscopy for early diagnosis of oral pre-cancer and cancer using minimally invasive samples' - Oral cancer is the 18th most common cancer worldwide. Despite improvements in treatment, there has been no significant improvement in the 5-year survival rate of oral cancer patients, which remains at around 50%. A key issue is the fact that diagnosing oral pre-cancer depends in the first instance on visual examination - there is a clear need for new objective techniques to detect premalignant lesions. Through a research project funded through Horizon 2020, the TU Dublin researchers developed a novel, non-invasive method for detecting precancerous oral lesions early. This could lead to more effective oral cancer treatments as well as improved survival rates.

Headed up by [Professor Fiona M. Lyng](#), and originally founded by [Professor Carmel Mothersill](#) RESC has made a significant contribution to the field of radiobiology. A 2021 article⁶ provides a reflection and scientific review of the work of the RESC from its beginnings. It describes the contribution of women radiobiologists in Ireland to the development of the discipline internationally and at home and to discuss the history of radiobiology in Ireland to date.



Major contribution of RESC to the field of radiobiology

⁵ https://cordis.europa.eu/article/id/428646-pioneering-technique-offers-oral-precancer-diagnosis?WT.mc_id=exp
⁶ Orla Howe, Fiona M. Lyng & Carmel Mothersill (2022) Women's contributions to radiobiology in Ireland; from small beginnings...., International Journal of Radiation Biology, 98:3, 331-340, DOI: [10.1080/09553002.2021.1931529](https://doi.org/10.1080/09553002.2021.1931529)

Artificial Intelligence

Globally, stroke is one of the leading causes of mortality with far-reaching public health and socio-economic impact. TU Dublin has a range of successful European funded projects in the area of ‘Artificial Intelligence (AI) for Stroke’. The University leads the computational modelling work in the [PRECISE4Q](#) project which is developing a set of data-driven AI systems to enable personalised stroke treatment. Work by researchers [Professor John D Kelleher](#) and [Dr Elizabeth Hunter](#) and in the project, has compared stroke risk factors across different age-cohorts and developed a set of risk models – these were more accurate than current methods in predicting stroke risk in younger age groups and as effective at predicting stroke risk in older age groups. Other research involves predictive modelling and the use of AI to improve the data quality in the global registry of stroke care quality.

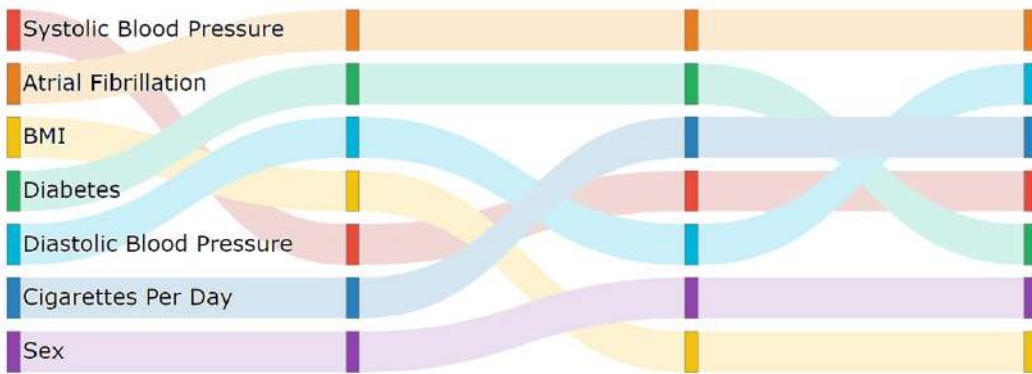


Figure 9 - Diagram illustrating the change in stroke risk factor importance by age-group, the higher the factor is ranked in an age-column the stronger the association between the risk factor and stroke in the next five years of a person's life

A-EYE

In April 2021, a collaboration between TU Dublin, Evercam Ltd and GagaMuller Technology Ltd was successful in securing funding from the [Disruptive Technologies Innovation Fund](#) for a project that supports digital transformation in the construction sector. Dr Mark Mulville and Dr Alan Hore, TU Dublin, are leading the work with partners on the A-EYE Construction Visualisation Platform. The A-EYE is a control tower that provides full visibility of large construction sites. It enables visual communication to deliver measurable productivity improvements, health & safety and sustainability improvements, and will also enable the realisation of lean construction principles and integration with other existing technologies such as BIM. Further details are available [here](#).



Customer Analysis

‘Customer churn prediction using explainable artificial intelligence techniques’ – was awarded funding from the Irish Research Council in 2021. This project is identifying currently available AI techniques and proposing new and improved strategies to minimise customer churn rates so as to maximise the profitability of businesses. The project focuses on identifying current state-of-the-art that can be applied to retain customers from churning, while also proposing models that would not only predict the customer who is likely to churn but also explain the causes of churn to the concerned business stakeholders. The project is led by [Dr Muhammad Atif Qureshi](#).

Sustainable Food Production

[Dr Anushree Priyadarshini](#) is the Principal Investigator of a number of research projects undertaken in 2021 focussed on the economic and sustainable dimensions of food waste. The EPA funded CircBioCityWaste project that brings together three Irish universities and experts from industry and local authorities to look at how to convert municipal and dairy industry wastes into a clean source of energy and develop the residuals into novel bio-fertilisers for plant growth and soil health. The project is also assessing customer acceptability of the innovative sustainable products as well as the economic impacts of developing these bio-based agrochemicals for Agri-farm businesses.

The project FORWARD (Food Waste in Ireland – Assessment, Environmental & Economic Burden, and Mitigation Strategies) is employing life cycle cost analysis to measure the environmental and economic costs of food waste, developing an environmental-economic footprint index as a decision support tool.

Fade

Festivals play an important cultural role in society. In response to the disruption caused by COVID-19, many festivals adopted digital technologies, which may continue post pandemic.

[FADE](#) – ‘Festivals, Audiences and the Digital Experience’, is a research project awarded funding by the Irish Research Council in 2021 under the COALESCE scheme and is led by [Dr Bernadette Quinn](#), School of Hospitality Management & Tourism and [Dr Brian Vaughan](#), School of Media. FADE aims to analyse the implications of the digital adaptations for the arts festival sector and to assess future needs by investigating how festivals are using digital technologies and how modes of creative practice and audience engagement are changing accordingly.





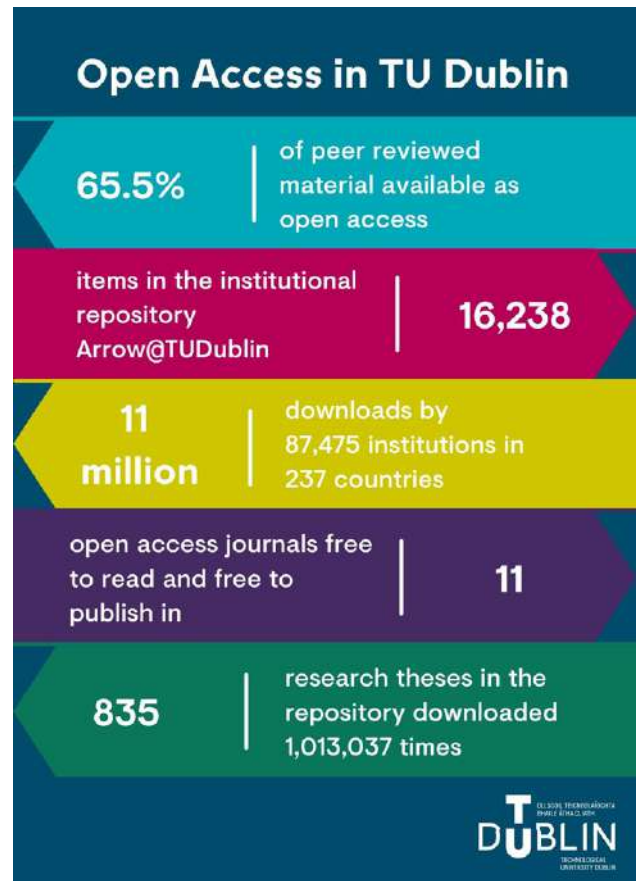
Partnership

3.1. PARTNERSHIP: Open Science, Open Innovation, Open to the World

Open Science

TU Dublin has engaged in Open Research for several years and has put in place a dedicated [Open Research Office](#), the first in higher education in Ireland. In addition to the Open Research Manager, an Open Scholarship Librarian was appointed in 2021. The unit has delivered a series of training modules for the research community in Open Research, Open Access, Open Data and Data Management Plans.

The University's open access facility, called '[Arrow](#)', continues to be very successful, with over 11 million downloads in 2021. Key achievements of TU Dublin's open access agenda are captured here.



TU Dublin continues to lead the work on open research in the [European University of Technology](#) alliance.

Open Innovation

TU Dublin is a pioneer of open innovation, collaborating extensively with outside organisations in the generation, transfer and utilisation of knowledge.

1. Knowledge Transfer

The Dublin Region Innovation Consortium (DRIC), which is led by TU Dublin, is a consortium that includes IADT, NCI and DIAS. It supports the development of new products and companies, delivering real impact in the Dublin region. The [KTI Annual Report](#) (2021), shows DRIC in the top three consortia for most knowledge transfer (KT) categories and a leader in licencing and spin-out creation (Table 3).⁷

Consortium	Research Expenditure	Licences, Options & Agreements	Spin-outs	No. Collaborative Research Agreements with industry	Invention Disclosures	Total No. New Patent applications filed during the year	Total No. New Patents granted in the year	Market Launches of products or services in year based on RPO licence
DRIC	€ 18.6	9.1	2.7	9.1	26.3	9.1	2.7	0.5
DCU-led	€ 37.4	7.0	0.8	18.7	10.7	1.6	2.4	0.3
Ignite West	€ 66.9	1.3	0.6	25.3	4.9	3.6	0.9	0.7
MU - led	€ 57.8	2.1	0.0	6.2	4.0	1.4	1.2	0.0
TCD - led	€ 122.6	3.2	0.4	9.4	6.5	2.8	1.6	0.8
UCD - led	€ 96.1	2.8	0.6	20.7	8.7	2.3	1.1	0.3
BRIDGE Network	€ 172.6	3.5	0.3	8.0	6.7	1.3	1.2	1.0
UL - led	€ 38.7	1.6	0.5	22.0	6.2	3.6	3.6	0.3

Table 3: Comparative Performance of Irish Consortia, per €10M research expenditure (KTI Report, 2021)

TU Dublin has successfully delivered its knowledge transfer plan. Examples in 2021 include:

- Technology Licences:
 - A blockchain solution to ePrescribing and ePrescriptions is to ensure security and the validity of prescriptions. In Ireland, 27% of written prescriptions were found to be in error, due to factors such as handwriting. The technology is licensed to a TU Dublin spin-out.

7

The Consortia members are: DCU-led (DCU & DKIT); Ignite West (NUIG, GMIT, ITS, LYIT); MU-led (MU, AIT, ITC, WIT); TCD-led (TCD, RCSI); UCD-led (UCD, NCAD); Bridge Network (UCC, MTU Teagasc); UL-led (UL, LIT)

- Antimicrobial effects of ovotransferrin. Ovotransferrin is a component of egg-white that forms part of the egg's innate antimicrobial defence system. It has uses such as a natural antimicrobial agent for foods. The technology for this license deals with use of ovotransferrin to prevent infection from pathogens that cause pneumonia and other serious conditions. The licensee is a leader in the use of natural proteins as biocides.
- Open Labs - Aimed at overcoming barriers to engaging in R&D, Open Labs celebrated its [third anniversary](#) in 2021. More than 150 SMEs were assisted in launching 90 new products, with 27% of companies engaging in follow-on research.
- Spin-Outs - Developments in 2021 include:
 - [Kastus](#) (antimicrobial surface treatment) is one of 8 Irish companies to receive funding under the [EIC's Accelerator Pilot](#). It announced global partnerships with leading companies - KONE, Lenovo and Lavazza.
 - [Ocumetra](#), a TU Dublin spin-out, received the [Knowledge Transfer Ireland People's Choice award](#). Co-founded by Professor James Loughman, Ocumetra was established to commercialise world-leading research on myopia control. It has successfully raised significant levels of investment, achieved Enterprise Ireland HPSU (High Potential Start-Up) status and secured global clients.



Daniel Izquierdo Hijazi, Jose Lopez Escobar, Tara McElligott and Sean Smith

[Micron Agritech](#) is an Irish Start-up founded in 2019 by Sean Smith, Daniel Izquierdo, Tara McElligott and Jose Lopez while they were undergraduates at Technological University Dublin. They spun-out of the University with their revolutionary parasite testing technology. The founders showcased their award-winning technology at Europe's largest agricultural show, the Irish National Ploughing Championships in 2019. Since then, the Micron Agritech team has expanded to a total of 9 people and they have raised a seed funding of over €500,000.

2. Entrepreneurship and Enterprise Development

TU Dublin's ambition is to inspire the next generation of entrepreneurs by embedding entrepreneurship in the curriculum and in research activity, making it pervasive across the whole University. Our aim is that TU Dublin will be the place where all aspiring entrepreneurs and creators wish to come, because the entrepreneurial environment - the networks, expertise and practical facilities - provide a launch-pad and a support framework that enables ambitious and talented people to start and grow successful businesses. Our role is to advocate for entrepreneurship as a serious career choice and facilitate entrepreneurs on their journey to *realising infinite possibilities*.

Supporting Entrepreneurial Mindsets - We wish to empower our students and graduates to be brave, bold, and ambitious and create opportunities for them to engage in learning experiences that develop their entrepreneurial mindset and competences. Already in place are curricular and co-curricular activities that provide experiential learning, experimentation and the development of critical skills in creative problem solving, design thinking, team building and leadership. The new [GROWTHHub](#) project builds on this platform. Launched in 2021 and funded by the HEA *Human Capital Initiative*, GROWTHhub is a €3M* collaborative project with WIT and industry, aimed at encouraging an entrepreneurial mindset for new ways of thinking, education, research and engagement.

GROWTHhub has already made its mark on the entrepreneurial community in TU Dublin.

- A dedicated student *Ideation Lab* was established at the Aungier Street facility and is used for design thinking and training for students working on collaborative entrepreneurship projects. The *Ideation Lab* includes makerspace resources including technology supports for AR and VR learning experiences and 3D printing.



GROWTHhub Ideation Lab

- The [Talks at GROWTHhub](#) programme was launched with entrepreneurs and innovation leaders sharing their stories and lessons learned with students.



- Fifteen [bursaries](#) were awarded to TU Dublin staff to develop new and innovative pedagogical resources that support the different stages of student entrepreneurial learning. Projects included digital entrepreneurship, disciplined innovation process management, developing entrepreneurial resilience, and design thinking for neurodiverse students.
- A range of entrepreneurship and innovation modules were designed, and several new programmes were launched, including the [Postgraduate Certificate in Entrepreneurship and Innovation](#), a programme designed specifically to support the development of women entrepreneurs and innovation leaders. Other new programmes launched included the *Postgraduate Certificate in Design Thinking, Entrepreneurship and Innovation* and the *Postgraduate Certificate in Digital Entrepreneurship*.
- GROWTHhub also supported the TU Dublin [ivenTUre](#) student entrepreneurship accelerator programme, where 35 students worked intensively on developing their new venture ideas with the support of a structured programme of development.

Supporting Entrepreneurs in the Region

From inspired minds come innovative concepts. Across our campuses we have developed a system of spaces and supports that enable fledgling ideas to grow into start-ups. These start-ups come from our staff, our students, our alumni, our researchers and from entrepreneurs from across the greater Dublin Region. TU Dublin offers a unique and comprehensive portfolio of entrepreneurial support services including:



4 High-Tech
business incubators



7,000m²
of business
incubation space



100+ Start-up
companies located on
campus



150 Companies
supported through Ireland's
largest New Frontiers
Programme each year

The [New Frontiers](#) Programme (funded by Enterprise Ireland), provides space, mentoring, supports and funding, to high-growth, early-stage start-ups in the Dublin region. TU Dublin has an unparalleled track record of achievement in supporting early-stage companies from the New Frontiers Programme through to High Potential Start-Up (HPSU) funding and beyond. Some developments in 2021 include:

- [Unitek.AI](#) - a fintech business that has partnered with [Legal & General](#)
- [MedModus](#) - an analytics provider to the healthcare sector, secured funding through Davy's EIS Fund to support sales growth.



[Porter & Nash](#) - produce fat free, gluten-free, plant based gravy and sauces made with roasted root vegetables and herbs infused with Irish seaweed for an umami flavour. The company serves a broad audience of people who love food and who also may or may not be vegetarians/vegans. BA Culinary Art graduates Gavin Cassidy and Eoin Lennon met at TU Dublin while upgrading their culinary skills and developed the prototype of their plant based gravy. In 2019, with support from the SuperValu food academy and participation in the New Frontiers programme at TU Dublin, Porter & Nash was formed. In 2021 Porter & Nash received a gold star for both of their sauces in the Great Taste awards. They are now sold in over 100 stores nationwide and the team are researching the export market.

TU Dublin is proud of the success of its start-up companies. Fourteen businesses working with our enterprise incubation facilities - *Hothouse*, the *LINC* and the *Synergy Centre* - were shortlisted for the [2021 National Start-up Awards](#). Supported by Enterprise Ireland, TU Dublin winners included:

- [Imvizar](#) - an augmented reality (AR) start-up that is 'Reimagining places and spaces with immersive storytelling'
- [LiveCosts.com](#) - automated construction cost management software for builders and trade contractors
- [Fiid](#) - plant-based ready meals
- [Peer Educational Technologies](#) - online assistive technologies for people with disabilities



Ailbhe and Izzy Keane, Izzy Wheels

Out of the [Enterprise Ireland 2021 'Hot 100 Start-ups'](#) list, that showcases emerging Irish companies set for global success, twelve businesses originated in TU Dublin, including:

- [Izzy Wheels](#) - Founded by Irish sisters Ailbhe and Izzy Keane, the idea was inspired by Izzy who was born with spina bifida and is paralysed from her waist down. Izzy has always seen her wheelchair as a symbol of freedom but never felt it expressed her personality. Ailbhe created a range of colourful wheel covers for her sister's chair as her final year project in NCAD. They are now bringing disability fashion to the world!



[Danu Sports](#) - Oisín Lennon graduated from TU Dublin with a BSc in Product Design. Building on concepts explored in his undergraduate thesis, he established Danu Sports. Its mission is to support the world's best teams to operate on the cutting edge of performance, through reduced injury risk and enhanced sports performance. The business has developed a wearable gait and performance analysis system, designed to replicate the accuracy of state-of-the-art lab-based analysis devices while removing the constraints of such equipment in real-world practice. Over €1m in seed funding has been raised from the European Space Agency Space Solutions Programme, Enterprise Ireland HPSU, and private investors. Danu Sports is currently a team of five and the product is undergoing final tests with a number of high-profile sports organisations in advance of its market launch later in 2022.

Supporting Entrepreneurship for All

The *Institute for Minority Entrepreneurship* was established to offer different minority groups in Ireland equal opportunity through entrepreneurship education and training. One example of the work in 2021 is a new report on women's entrepreneurship in Europe, launched by Professor Tom Cooney. Involving research from 25 countries, the [report](#) is focused on finding the best ways to support businesses driven by women entrepreneurs in Europe.

3.2. PARTNERSHIP: A Tightly Connected Network

TU Dublin is building on over 100 years of collaboration with academia, industry and community. Understanding that collaboration drives superior outcomes to benefit society, a new *Vice President for Partnership* was appointed in September 2021, to promote, expand and deepen the University’s partnerships.

A University without Borders

During the academic year 2020/21, TU Dublin delivered 187 programmes in collaboration with industry partners, including professional bodies, SOLAS, Springboard, Skillnet, private industry, and community and public sector organisations. Figure 10 provides a breakdown of the academic programme collaborations by stakeholder category.

In terms of global engagement, we collaborated with 19 universities across the globe in the delivery of academic programmes leading to joint/dual/multiple awards. We also continued our collaborations with HEIs nationally, including in the delivery of a *BSc in Human Nutrition & Dietetics* with Trinity College Dublin and a *Bachelor of Music Education* with Trinity College Dublin and the Royal Irish Academy (RIA).

A diverse range of programmes were delivered in partnership with multinational companies - such as Intel, Microsoft, Amazon AWS, Oracle and 3 Telecom - and Irish companies, such as Musgraves, NIBRT, ESB and Gas Networks Ireland (GNI).

TU Dublin worked closely with industry stakeholders to enable over 3,200 students to benefit from work placements and internships. We also engaged with Professional and Regulatory Bodies. A total of 126 programmes were accredited by a Professional Body, with almost 9,000 students registered on these programmes.

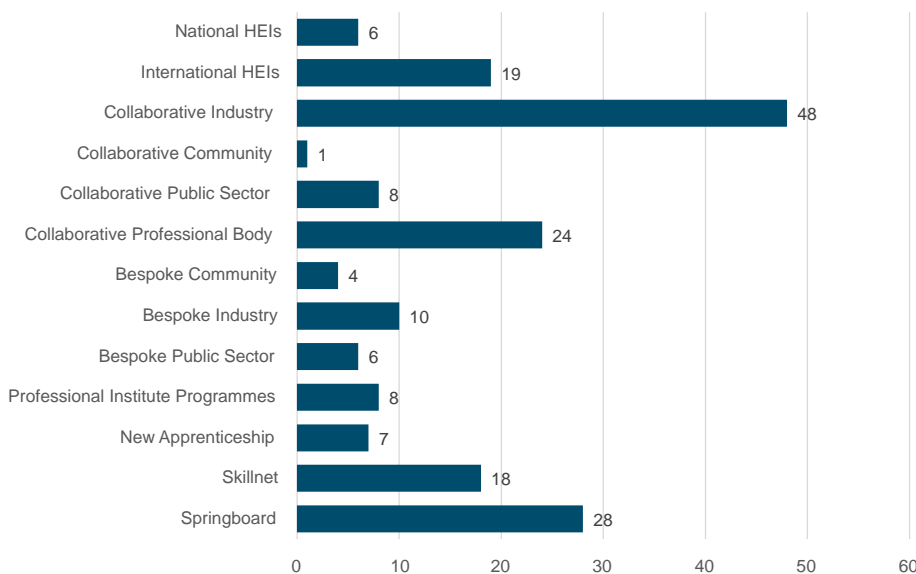


Figure 10: TU Dublin Academic Programme Collaborations by Category

The European University of Technology

TU Dublin is leading on several projects within the EU+ ([European University of Technology](#)) alliance, which comprises eight European technological universities:

- Bulgaria: Technical University of Sofia (TUS)
- Cyprus: Cyprus University of Technology (CUT)
- France: University of Technology of Troyes (UTT)
- Germany: Hochschule Darmstadt, University of Applied Sciences (h_da)
- Ireland: Technological University Dublin (TU Dublin)
- Latvia: Riga Technical University (RTU)
- Romania: Technical University of Cluj-Napoca (UTCN)
- Spain: Polytechnic University of Cartagena (UPCT)

The Alliance was formed as part of the European Universities Initiative to revolutionise the quality and competitiveness of European higher education, including the creation of a common curriculum spanning Europe. The EU+ focus is on building European bachelor degrees, integrating existing Master degrees, supporting the harmonisation of apprenticeship and lifelong learning, and creating a common laboratory for pedagogical research and student-centred learning (ELaRA). In 2021, the Alliance agreed a pathway towards common training programmes for European degrees in engineering.



'Think Human First' is a fundamental principle underpinning the EU+ project.

Collaboration with the Construction Industry to Support Project Ireland 2040

The [Build Digital Project](#), led by TU Dublin, is a consortium, with the *Construction Sector IT Alliance* (CITA) and other HEIs (MTU, ATU, and SETU). Over 50 industry personnel from across the full construction lifecycle are working directly with the project team.

The project aims to drive digital transformation in the sector and create a more circular economy in the built environment sector – one that prioritises designing out waste. It is focused on five pillars:



Digital Leadership & Cultural Change



Digital Standards



Digital Education & Training



Digital Procurement



Sustainability & Climate Action



L-R: Pat Lucey, Build Digital Project – Steering Group Chair; Rinku Phulphagar, Department of Public Expenditure and Reform; P.J. Rudden, Construction Sector Group Innovation and Digital Adoption Subgroup Chair; Kevin Meaney, Department of Public Expenditure and Reform; Robert Moore, Build Digital Project – Project Lead; Avril Behan, Build Digital Project – Project Director; Colm Farrell, Department of Public Expenditure and Reform; Suzanne Purcell – Build Digital Project – PMO Lead.

Transforming University-Enterprise Engagement

[Convene](#) is a project led by TU Dublin in partnership with UCD and enterprise partners, that seeks to increase the capacity of higher education to anticipate, understand and deliver emerging skills needed by enterprise.



FOR ENTERPRISE

We aim to build strong, inclusive, and enduring partnerships that leverage and support the capacity within enterprise itself for talent development and innovation.



FOR LEARNERS

We deliver accessible programmes that future-proof graduates and our workforce, and offer life-long learning and upskilling opportunities for all types of learners.



FOR ACADEMIA

We support faculty and staff by giving them the space, time, and resources to explore new approaches to education and co-create skills and innovation solutions with enterprise.

A year after its establishment, TU Dublin welcomed Taoiseach Micheál Martin to the [Convene Enterprise Forum](#) (October 2021), which brought together a panel of enterprise and higher education leaders to discuss lessons learned from the pandemic, including how to collectively deliver the priority skills and innovation necessary to reinvigorate business, and how to support a resilient and enduring economic recovery post COVID-19.

In August, *Convene* launched a suite of third level education programmes aimed at supporting talent development in the tourism and hospitality sector, to assist the industry in retaining and regaining qualified staff in the wake of the pandemic.



Taoiseach Michael Martin speaking at the inaugural Convene Enterprise Forum

Collaborative Research & Engagement

TU Dublin engaged with industry on several research and innovation projects during the year.

Kepak invested €250,000 in a science-driven culinary innovation partnership with TU Dublin to establish a new research team focused on meat optimisation, sustainability, packaging, health and nutrition. This strategic partnership will work towards culinary innovation research considering changing consumer trends and increased environmental awareness. The new state-of-the-art facilities, with food sensory labs, is located in the Central Quad on the Grangegorman campus.

Autodesk, a multinational software company, renewed its commitment to support the development of the new TU Dublin *Design and Construct Centre* - Ireland's first centre of excellence for construction education. This extended partnership will see the development of a designated space for Autodesk at the Centre, where the company will provide multi-disciplinary learning and training to TU Dublin staff and students. through free access to the [Autodesk Construction Cloud](#). This platform is a powerful construction management tool for the entire building lifecycle, connecting workflows and allowing secure collaboration on a common data environment.

TU Dublin and *Intel Ireland* have a multi-year partnership, as part of a far-reaching programme of collaboration in future talent development, research and engagement. One significant initiative was the opening of the 250-seater Intel Auditorium lecture theatre located in the flagship Central Quad. This double height space is the largest teaching space in the Central Quad building and was unveiled in March 2021.

Working closely with Intel, TU Dublin adapted its part-time programmes to suit the shift work patterns of Intel Ireland and other industry partners. TU Dublin is a leader in flexible education provision, with 33% of its programmes delivered in flexible modes.

Collaboration with *Gas Networks Ireland (GNI)* involved establishing an interorganisational sustainability group to explore mutually beneficial collaboration opportunities. As a result, GNI provided student placement opportunities and collaborated on STEM workshops for secondary school students on biodiversity project topics.

In the area of healthcare, TU Dublin established a strategic partnership with *Tallaght University Hospital (TUH)* and healthcare providers *UPMC* and *ExWell Medical*. This partnership aims to explore several areas of mutual interest including academic programme development, access to TU Dublin research expertise and facilities, and identifying technology that could expand health and fitness initiatives. The alliance will also explore the potential for educational and professional development initiatives to foster new talent in healthcare and associated disciplines.

Community Engagement

In May, an [EU funded report](#) was launched which profiled community engagement activity at TU Dublin. In terms of scale, the following give some approximate sense of the community-related activity undertaken by TU Dublin on an annual basis:

- Working with **more than 300** external partners
- Processing **4,000+** applications to TU Dublin's Access and disability entry routes
- Supporting over **1,000** Access students
- Facilitating **130** Access Foundation Programme students to progress to higher education
- Supporting over **1,300** students with disabilities
- **1,000** students and **50** lecturers engaged in community-based learning and research projects
- **800** primary school students using CliCNews.ie literacy/news website
- **300** primary and secondary school students attending workshops on campus
- Outreach for **29** linked DEIS partner schools – presentations to **800+ students**

During 2021, we continued to engage with social, cultural and community development organisations, including through initiatives such as *3-D Assist*, the *Junior Cycle Workshop Programme*, and several community-engaged research and learning (CERL) projects.

The [Junior Cycle Workshop Programme](#) began as an outreach engagement activity with four schools close to the Grangegorman Campus, having secured funding from *basis.point*. In 2021, an additional three-year funding stream was agreed and the project extended its reach to 15 inner-city DEIS secondary schools. The programmes provide a range of exciting activities and workshops on campus in business, music, sport, STEM, wellbeing and study skills. During the 2020/21 academic year, 800 students from DEIS secondary schools engaged in workshops.

3.3. PARTNERSHIP: Being Global

TU Dublin aims to drive collaboration with key strategic partners nationally and internationally to expand our reach, gain access to international practice and enhance our education and research capabilities.

International Collaborations

A significant goal of the European Universities Initiative is to strengthen strategic partnerships across the EU between higher education institutions, encouraging the emergence of twenty European Universities by 2024. The European University of Technology (EUt+) of which TU Dublin is a member, was one of only 41 alliances selected out of a total of 116 applicants to enter a three-year pilot programme. EUt+ has over 100,000 students and 11,500 staff. In 2021, the EUt+ alliance explored and debated matters of critical importance to today's society through a series of roundtable public discussions and conferences, including *Equality in Higher Education*. The [Think Human First Seminar Series](#) investigated the ethical and societal implications of technology associated with the growth of AI and social networking platforms and the human influence on climate disaster.



Professor Sarah Jane Delaney participated in a panel discussion at the EUt+ conference on Equality in Higher Education held in Universidad Politécnica de Cartagena (UPCT)

Another example of collaboration in 2021, was with the Technical University of Cartagena (UPTC) under the *ERASMUS staff mobility programme*. Engineering staff from TU Dublin delivered a series of thematic practical workshops on implementing the *Internet of Things (IoT)* to students of *UPTC, Pedagogical and Technological University of Colombia*.

TU Dublin's Global Reach

TU Dublin has 19 international programme collaborations leading to dual/joint/multiple awards, including with Hanyang University (Korea), Tangshan Polytechnic College (China), Hainan University (China) and Nanjing University of Technology (China). These collaborations are in addition to our activities within the EU+ consortium and our partnership agreements under *Erasmus*. We reached a significant milestone in 2021, celebrating 15 years of collaboration with Nanjing Tech University (NJTech). We have over 700 overseas students on the NJTech campus, enrolled on joint programmes in Mechanical Engineering, Electronic Engineering, Pharmaceutical Science. A new *Bachelor of Engineering (Honours) in Civil Engineering* was launched in September 2021.

TU Dublin is also leading on a €3.5m European Project, *Collaborative Intelligence for Safety-Critical Systems (CISC)*, to create training programmes to ensure that AI products developed by European innovators are human-centric. The project will establish a *MARIE CURIE International Training Network* for 14 early-stage PhD students in the field of collaborative AI systems. This is the first educational programme of its kind, and CISC will also develop a blueprint for postgraduate training in the ground-breaking field of Collaborative Intelligence Systems.



Ms Jennifer Boyer, TU Dublin, Vice President of Sustainability speaking at the launch of ARISE
 Photo by Conor Healy, Picture It

ARISE is a £1.12 million European digital construction project aimed at supporting the transition of the construction sector by revolutionising the learning process and changing the face of delivery and recognition of sustainable energy skills in the construction sector to contribute to the European Recovery and Resilience Plans 2021-2027. TU Dublin and lead partner *Belfast Metropolitan College* launched the new initiative in a two-day kick-off session with nine partners from North Macedonia, Netherlands, Brussels, Italy, Denmark and Portugal.

Erasmus+

Erasmus+ is the European Union's (EU) flagship education and training programme in the third level education sector. TU Dublin has over 300 active Erasmus+ agreements with 245 different universities in 26 countries, with the capacity to accept and send almost 1,000 incoming and outgoing students respectively. Pre COVID-19, TU Dublin had the highest number of outgoing Erasmus students among higher education institutes in the Dublin region. *Universitat Politecnica de Valencia* in Spain is a key Erasmus+ partner with ten Erasmus+ agreements across a range of disciplines. TU Dublin also has Erasmus+ mobility agreements with each of its eight partners in the EU+.

In August 2021, TU Dublin organised the Erasmus+ project, [A-STEP 2030: Attracting Diverse Talent to the Engineering Professions](#). An online Summer School, which was hosted in *Aalborg University* along with academic partners, *ENSTA Bretagne* and *Metropolia University of Applied Sciences*, took place over three days and welcomed 30 international students.

International Student Mobility

International student mobility and enrolments were significantly disrupted due to COVID-19. While travel restrictions are easing, access to Asia remains restricted into 2022.

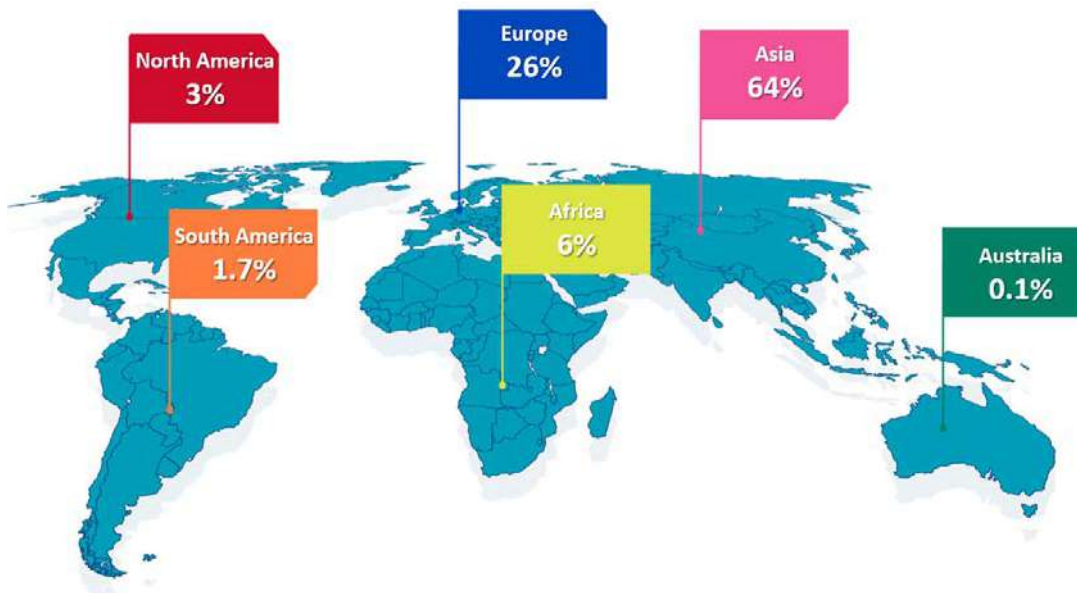


Figure 12: TU Dublin International Student Origin 2020/21

During 2021, TU Dublin continued to prioritise international student wellbeing, including through arrangements for safe accommodation, protocols for safe travel to Dublin, online orientation, engagement with key support staff and online social events.

Looking to the future, a new *Study Abroad Programme* was developed, which will initially focus on the North American market and selected Asian markets. As the University emerges from the effects of the pandemic TU Dublin looks forward to welcoming its international community back on campus.

3.4. PARTNERSHIP: Organisational Effectiveness

A priority objective in our Strategic Intent is organisational effectiveness - to ensure the University can deliver on its ambitions. Establishing a new organisation structure is fundamental to this process, laying the foundations to achieve a responsive and agile university.

In line with our plan to create a new organisational design for TU Dublin, we completed the *High-level Organisational Design Phase 1*, and proceeded to *Phase 2 - The Detailed Design Stage* of the plan. In the area of Professional Services, seven professional service functions, including HR and Finance, completed their detailed designs by August 2021. Each team produced a design report, setting out the design and ambition of the future function. This emerged from work involving an analysis of the service, including user experiences, capability analysis and benchmarking. It also set out the vision and the new structure for the service, including a change impact assessment.

In parallel, the designs for the faculties and schools commenced in January 2021. This work would determine the future faculties in the University, the number of schools in each of those faculties and the discipline groupings in each school. Consultation and work continued to October 2021, with the size and scope for each faculty subsequently confirmed in December 2021. The detailed design phase for academic units is due for completion by June 2022, with transition to the new faculty and school structure by September 2022.

The appointment of the University Executive Team (UET) was a significant milestone in 2021. The broad remit of the UET is outlined on the following pages.

University Executive Team (UET)

Professor David FitzPatrick



President

Denis Murphy



Chief Operations Officer

- Human Resources
- Finance
- Technology/ICT
- Estate and Facilities
- Governance and Compliance

Dr Mary Meaney



Registrar and Deputy President

- Student Services and Wellbeing
- Academic Affairs and Teaching, Learning and Assessment
- Library
- Faculties

Niamh Shannon



Vice President Organisation, Change and Culture

- Organisational Development and Culture
- Change Management
- Organisational Design and Delivery
- Staff Development

Jennifer Boyer



Vice President Sustainability

- Sustainability Strategy and Policy
- Physical University Environment (development and planning)
- Embedding Sustainability across the Curriculum

Thomas Stone



Vice President Partnerships

- Strategic Partnership
- Enterprise Engagement
- Civic Engagement

Dr Orla McDonagh



Dean, Faculty of Arts & Humanities

- Faculty Mangement
- Schools
- Pan-University Responsibilities

Dr Eoin Langan



Dean, Faculty of Business

- Faculty Mangement
- Schools
- Pan-University Responsibilities

Professor James Curtin



Dean, Faculty of Engineering & Built Environment

- Faculty Mangement
- Schools
- Pan-University Responsibilities

Dr Brendan Jennings



Vice President Research and Innovation

- Research Hubs
- Research Academy
- Graduate Research School
- Research Support Services
- Innovation and Knowledge Transfer

Professor Pramod Pathak



Dean, Faculty of Digital & Data

- Faculty Mangement
- Schools
- Pan-University Responsibilities

Professor Michael Devereux



Dean, Faculty of Sciences and Health

- Faculty Mangement
- Schools
- Pan-University Responsibilities



Institutional Review (CINNTE)

All Irish higher education institutions are periodically reviewed by Quality and Qualifications Ireland (QQI) from a quality assurance and enhancement perspective. This review takes place through a cyclical process known as CINNTE, the Irish word for *Certain*. As part of the CINNTE process, TU Dublin completed a critical self-evaluation process in October 2021. The Institute Self-Evaluation Report (ISER) produced for the review, considered how TU Dublin is approaching quality assurance and enhancement and provides documented evidence of quality standards. It addressed seven key thematic areas:

- I) The TU Dublin Quality Framework
- II) The Student Experience
- III) Characteristics of TU Dublin's Programme Provision
- IV) Supporting TU Dublin Staff
- V) Industry, International and Civic Engagement
- VI) Research, Innovation and Impact
- VII) Learner Information Systems and Data Management

Recommendations for enhancing academic quality and excellence across the different areas were provided in the report.

Panel Visit and Quality Improvement Plan

As part of the process, a QQI appointed panel of national and international experts visited TU Dublin in October. They met with staff, students, alumni and external stakeholders, to review policies and practices across a range of academic matters, including teaching and learning, student support, research, and staff development. As a newly established university, the review was designed to be forward-looking in its objectives. Key areas for strategic development of the TU Dublin Quality Framework, identified as part of the review process, are outlined in the following table.

Areas for Strategic Development	Key Initiatives to Support Quality Enhancement
TU Dublin Quality Framework	Bringing three similar but disparate systems into one: <ul style="list-style-type: none"> - Design and implement a unitary Quality Assurance Framework for TU Dublin to underpin and strengthen taught provision across TU Dublin and the quality of the awards made - Upgrade the Student Record Management System (SRMS - Banner) to underpin the quality framework. Transition to enhanced online systems for student learning and feedback on programmes and modules. - Engage with SOLAS and QQI to support sectoral initiatives to enhance the quality and standing apprenticeship and higher education in Ireland.
The Student Experience	To create a differentiated student experience for TU Dublin students reflecting the vision for Technological Universities with a new University Education Model.
Characteristics of TU Dublin's Programme Provision	Within boundaries, affording students agency in defining an education pathway aligned to their specific needs and ambitions.
Supporting TU Dublin Staff	A University-wide change management and communications project to be implemented, to lead and manage the organisational transformation required to deliver on the TU Dublin Strategic Intent to 2030.
Industry, International and Civic Engagement	Develop new integrated governance structures and policies to strengthen and enhance engagement.
Research, Innovation and Impact	<ul style="list-style-type: none"> - Develop and roll-out implementation of the new Research Information System (cRIS) - Review and update the academic regulations that support research degree provision - Roll out a new training programme for Structured PhD students, with a concentration on professional skills development and on broader research skills. - Ensure that quality enhancement is embedded in the organisational design for Research & Innovation (R&I).
Learner Information Systems and Data Management	<ul style="list-style-type: none"> - Continue the process of integrating and consolidating IT systems across the three main campuses of TU Dublin. - Develop a centralised approach to data management, reporting and learning analytics.

As TU Dublin is in its formative phase, the CINNTE review provided a valuable opportunity to leverage the expertise of a panel of national and international experts to affirm, inform and enhance our approach towards implementing our strategic plan, our new organisational design, our unitary quality framework, and other ongoing transformation activities.



Equality, Diversity & Inclusion Statement

TU Dublin is committed to [Equality, Diversity & Inclusion](#) for staff and students in all areas of the University's work. This is expressed formally in the TU Dublin Equality Statement (2019-2022). In 2021, the University addressed the public sector duty through the promotion and protection of human rights in all aspects of University work, and by developing and approving equal opportunity plans in the areas of gender equality (including gender expression and identity), race equity, consent and ending sexual violence and harassment.

EQUALITY STATEMENT

(a) The Technological University Dublin (TU Dublin) is committed to ensuring that the student body entering, participating in and completing its programmes at all levels reflects the diversity and social mix of the Dublin region, and Ireland's, population. The access policy takes full account of UN Sustainable Development Goal 4 to 'Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all'⁸. The policy rests on a culture of inclusion where all have equitable opportunity to access the education it provides. The University is especially cognisant of the challenges to participating in higher education faced by persons from backgrounds of economic or social disadvantage, persons who have diverse abilities, and persons coming from sections of society significantly underrepresented in the student body. TU Dublin enables equity of access and education to these groups through an integrated policy that provides a range of pre-entry activities, alternative entry arrangements and post-entry supports. It also aims to provide an enhanced experience and positive educational outcomes for all students through the utilisation of approaches such as Universal Design and Universal Design for Learning in the provision of education and related services, supports and facilities. The University's access policy is fully aligned with the National Access Plan.⁹

(b) TU Dublin is committed to advancing equality, including gender equality, in all aspects of its work. The equality work of the University benefits from being informed by the UN Sustainable Development Goals, including SDG 5 'Achieve gender equality and empower all women and girls'. The University policy on equality, including gender equality, is guided by the statutory obligation to have regard to the need to eliminate discrimination, promote equality of opportunity and protect the human rights of staff, students and service users.¹⁰ It is committed to ensuring gender balance in key decision-making committees. It aims to address gender imbalances amongst staff and the student body in academic disciplinary fields and functional areas where traditional patterns of male or female predominance can be found. It is also cognisant of the need to address intersectional aspects that contribute to the compounding of inequalities such as ethnicity, diverse ability, gender and other identities, and social disadvantage. The University also adheres to and implements statutory and sector-wide best practice policies, including the Athena SWAN Charter Principles¹¹, the recommendations of the Higher Education Authority National Review of Gender Equality in Irish Higher Education Institutions¹² and Gender Action Plan 2018-2020¹³, and the Public Sector Equality and Human Rights Duty.¹⁴

8 <https://sustainabledevelopment.un.org/topics/sustainabledevelopmentgoals> (last accessed 2 May 2019)

9 <https://hea.ie/assets/uploads/2018/12/HEA-Progress-Review-NAP-2021.pdf> (last accessed 2 May 2019)

10 Section 42 of the Irish Human Rights and Equality Commission Act 2014.

11 <https://www.ecu.ac.uk/equality-charters/athena-swan/about-athena-swan/> (last accessed 2 May 2019)

12 https://hea.ie/assets/uploads/2017/04/hea_review_of_gender_equality_in_irish_higher_education.pdf (last accessed 2 May 2019)

13 <https://hea.ie/assets/uploads/2018/11/Gender-Equality-Taskforce-Action-Plan-2018-2020.pdf> (last accessed 7 May 2019)

14 <https://www.ihrec.ie/our-work/public-sector-duty/> (last accessed 2 May 2019)



Sustainability Statement

TU Dublin is committed to working with staff, students and other stakeholders to address the challenges of environmental sustainability. This commitment is expressed formally in the TU Dublin Sustainability Statement.

TU DUBLIN SUSTAINABILITY STATEMENT

TU Dublin recognises its special role in helping to address the challenges of climate change and sustainability. It wishes to ensure that all students graduate from TU Dublin with a greater understanding of the sustainability challenges and possess the expertise and commitment to help find solutions for tomorrow's generations. The University aims to build and operate its campuses as living labs that support teaching, research and innovation and that contribute to the well-being of every member of its immediate and extended community – and ultimately to the health of the planet.

The process has started with the University putting in place the means to attaining Green Flag status for the relevant campuses.

TU Dublin is committed to working to ensure that all employees are made aware of the importance of systematic environmental work and to encourage individual responsibility for sustainability actions in all aspects of their roles. Advocacy and support is in place to encourage academic staff and students with initiatives and interventions, particularly on campus, that assist in addressing the challenges of environmental sustainability. It is expected that such initiatives will become pervasive and will become embedded within the University's standard academic provision over time. TU Dublin will continue to review measures to reduce the use of natural resources and the environmental impact of air, land, and water pollution caused directly or indirectly by the University's operations. This activity will be benchmarked against international norms and the University will work to ensure that aspects relating to environment sustainability are considered in all relevant decisions. It will also ensure that sufficient resources are allocated to the continuous improvement of environmental performance.

TU Dublin intends to continue to work collaboratively with the student body, industry, the local community and other stakeholders, to seek to broaden its impact and enhance its environmental work.



7.1 Governance: Governing Body

Background

Technological University Dublin (TU Dublin) was established by Ministerial Order under Section 36 of the Technological Universities Act 2018, (Number 3 of 2018), and Statutory Instrument, (Number 437 of 2018), on the appointed day of 1st January 2019. Under the 2018 Act the University is required to have a Governing Body to perform the functions of the University. The Governing Body is, therefore, the authority established by law to govern the University. The functions of the Governing Body are set out under Section 9, Functions of Technological University, TU Act (2018).

The Governing Body must operate in accordance with Schedule 1, of the 2018 Act. The Act states that the total membership of the Governing Body shall be not fewer than 14 and not more than 22 members. Members of the Governing Body perform key roles in relation to the direction, strategy, and corporate governance of the University. Members take collective responsibility for the long-term sustainability of the University, working with the Chair of the Governing Body, the President and the University Executive Team to ensure that the University is managed and developed in line with legal and policy parameters and accepted standards of best practice.

Governing Body Membership

The term of office of a member of the Governing Body, (with exception of the President and student members), shall not exceed 4 years and such a member may not serve more than 2 consecutive terms of office. During the period 1st January to 31st December 2021 a number of members were appointed to and retired from the Governing Body on the dates highlighted.

Governing Body Committees

To assist in carrying out its functions, Governing Body has established five Committees; an Audit and Risk Committee, a Finance and Property Committee, an Equality, Diversity and Inclusion Committee, a Nominations Committee and a Nominations and Process Committee. The President is an ex-officio member of each Committee with the exception of the Governing Body Audit and Risk Committee and the Nominations Committee.

Compliance with TU Dublin Code of Governance

A robust system of governance is vital to enable the University to operate effectively and for Governing Body to discharge its responsibilities as regards transparency and accountability.

The University has in place a Code of Governance, drafted taking the original 2016 Code of Practice for the Governance of State Bodies as its starting point and adapted to bring it in line with the Technological Universities Act 2018. This is a living document that will evolve over time in line with both best practice and legislative changes. The most recent version updated in March 2021 is published on the [University website](#).

The Governing Body are responsible for preparing the annual report and financial statements and opining on whether they consider the financial statements to be a true and fair view of TU Dublin's financial performance and its financial position at the end of the year. They are responsible for ensuring that timely and accurate disclosure is made to the Minister on all material matters regarding TU Dublin including the business context, financial performance and position and governance of TU Dublin.

The following compliance items from the Code of Governance are of particular importance:

- i. The Chair of Governing Body and President of TU Dublin signed an Oversight Agreement with the HEA setting out the broad governance and accountability framework and key responsibilities which form the basis of the relationship between the HEA and the University; this is underpinned by the relevant legislation, Government circulars (where applicable), the Code of Practice for the Governance of State Bodies, 2016 as encapsulated by the TU Dublin Code of Governance, statutes, charters, articles and instruments of governance, particularly those which establish the HEA and the University.
- ii. The Governing Body approved the annual programmes and budgets of the University including an analysis of performance against budget.
- iii. An internal review of the effectiveness of the Governing Body is completed annually. An external evaluation is performed at least once in the term of each Governing body.
- iv. The Governing Body meets sufficiently regularly to discharge its duties effectively and has a schedule of matters specifically reserved for it for decision. Governing Body met on seven occasions during the period 1st January to 31st December 2021.
- v. During the period 1st January to 31st December 2021 the Audit and Risk Committee met 10 times
- vi. TU Dublin publishes its annual report and financial statements within one month following completion of the audit of the financial statements by the Comptroller and Auditor General.
- vii. Through the Audit and Risk Committee, Governing Body assesses the University's principal risks, including a description of these risks, where appropriate and associated mitigation measures or strategies.
- viii. TU Dublin continues to adhere to all relevant aspects of the Public Spending Code.

Governing Body Membership 2021

	GOVERNING BODY MEMBER	CATEGORY	APPOINTMENT DATE	
1	FitzPatrick David	President	1 st January 2019	
2	Carr Michael	Staff Member	15 th January 2019	
3	Bistany Valerie	External Member	1 st July 2019	
4	Carroll Evelyn	External Member		
5	Finan Éilish (<i>Deputy Chair</i>)	External Member		
6	Grant Jerry	External Member		
7	Larkin Charles	External Member		
8	McCarthy Justin	External Member		
9	O'Toole Aileen	External Member		
10	Barnes James ¹⁵	Staff Member		
11	Kelly Pamela	Staff Member		
12	Marjoram Martin ¹⁶	Staff Member		
13	O'Shaughnessy Susan	Staff Member		
14	Beecher Noel ¹⁷	External Member		24 th June 2020
15	Bejarano Canizares Ana ¹⁸	Student Member		1 st July 2020
16	Bennett Lee ¹⁹	Student Member	1 st July 2020	
17	Gorman Rebecca ²⁰	Student Member	1 st July 2020	
18	Carson David (<i>Chair</i>)	External Member	1 st January 2021	
19	Duffy Christy	External Member	3 rd February 2021	
20	Burns Norah	External Member	23 rd June 2021	
21	Clune Mulvaney Catherine	External Member	23 rd June 2021	
22	O'Donovan Conor	External Member	23 rd June 2021	
23	Maher Eamon	Staff Member	1 st July 2021	
24	Ryan Maggie	Staff Member	1 st July 2021	
25	O'Donnell Mark	Student	1 st July 2021	
26	Barrett Lesley	Student	1 st July 2021	
27	Sheridan Stephen	Student	9 th December 2021	

¹⁵ James Barnes completed his term of office on 30th June 2021.

¹⁶ Martin Marjoram completed his term of office on 30th June 2021.

¹⁷ Noel Beecher resigned from Governing Body on 25th November 2021.

¹⁸ Ana Canizares Bejarano completed her term of office on 30th June 2021.

¹⁹ Lee Bennett completed his term of office on 30th June 2021.

²⁰ Rebecca Gorman completed her term of office on 30th June 2021.

7.2 Academic Council Membership 2021

	ACADEMIC COUNCIL MEMBER	CATEGORY
1	FitzPatrick David (Chair)	President
2	Meaney Mary	Registrar
3	Harvey Assumpta	Academic
4	Bowe Brian	Academic
5	Brennan Bairbre	Academic
6	Cafolla Antonio	Academic
7	Ana Cañizares Bejarano ²¹	Student
8	Carroll Kenneth	Academic
9	Darby Fionnuala	Academic
10	Dillane Dominic	Academic
11	English Ray	Academic
12	Ennis Patricia	Academic
13	Farrell Jennifer	Professional Management and Support Services
14	Farrelly Gerard	Academic
15	Farrelly Seán ²²	Student
16	Feeney Sharon	Academic
17	Gleeson Bridget	Professional Management and Support Services
18	Gorman Rebecca ²³	Student
19	Gormley Brian ²⁴	Professional Management and Support Services
20	Grennan Anthony	Academic
21	Healy Sylvia	Academic
22	Heffernan Elizabeth	Professional Management and Support Services
23	Jamaa Hamza ²⁵	Student
24	Jennings Brendan	Professional Management and Support Services
25	Killion Siobhán	Academic
26	Maguire Maev	Academic
27	McGrath Fabian	Academic
28	McGrath Mark	Academic
29	McKiernan Tara	Academic
30	Moran Fintan	Academic
31	Mulvey Tom	Academic
32	Murphy Brian	Academic
33	Murray Brian	Academic
34	Norton Susan	Academic
35	O'Reilly Isobel	Academic
36	Owende Philip	Professional Management and Support Services
37	Rooney Tara	Academic
39	Scally Mary	Student Representative
40	Stone Thomas	Professional Management and Support Services
41	Walsh Maureen	Academic
42	O'Donnell Mark ²⁶	Student
43	Lane Sinead ²⁷	Student
44	Sheridan Stephen ²⁸	Student

21 Ana Cañizares Bejarano (2020/2021 Student's Union Postgraduate Officer) continued to serve until replaced by Stephen Sheridan in by-election held 24th November 2021.

22 Seán Farrelly new term of office for re-elected TU Dublin SU officers began September 1st 2021.

23 Rebecca Gorman completed her term of office on 30th June 2021.

24 Brian Gormley on secondment to National Forum on Teaching and Learning from August 2020 – December 2021.

25 Hamza Jamaa new term of office for re-elected TU Dublin SU officers began September 1st 2021.

26 Mark O'Donnell term of office commenced in September 2021.

27 Sinead Lane term of office commenced in September 2021.

28 Stephen Sheridan term of office commenced in September 2021.

7.3 Financial Statements

The University prepared its first full year set of Audited Financial Statements for the twelve months to 31st August 2020. These Financial Statements reflected a Net Assets position for the University of €417.6million. In the period, the University recorded a surplus of €12.6m on total income of €307million.

The full financial statements are available on the [TU Dublin website](#).