THEA Budget Submission

September 2020

Enabling the emerging technological higher education sector[1] to deliver national policies for economic growth

Developing Resilient Communities, Regions and Enterprises

"The TU concept is distinctive – a wide scope of levels of technological provision, rooted in regional connectedness, reaching out nationally and internationally through teaching, learning and research collaborations, and enabled by digital connectivity"

TURN report, 2019

A 3-year plan

The Technological Higher Education Association[2]

September 2020

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[1] In the context of this submission, the 'technological higher education sector' comprises all of those Institutions currently members of THEA - i.e. 11 organisations: AIT, CIT, DkIT, GMIT, IADT, LIT, LYIT, IT Carlow, IT Sligo, IT Tralee, WIT.

[2] Appendix 1 lists the members of the submission working group

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Executive Summary

This submission makes the case that long term investment in the technological higher education sector will deliver the dividend of achieving national policies and strategic objectives as well as continuing to provide the talent pool required by enterprises to deliver economic, social and cultural recovery and growth. This sector has a proven track record of delivering on national priorities and delivering impactful change across the regions - further Investment will continue to deliver significant returns nationally, regionally and for our wider society.

Together with immediate impact of Covid-19, the four areas of long-term impact identified in the THEA submission for the 2019 budget continue to be priorities for the sector. The specific investment needs of the technological higher education sector are articulated for each of these domains. The sector acknowledges that some of the proposals made in the 2019 submission were already actioned both by the sector and the department; the report by the Technological Universities Research Network (TURN) was one significant follow on action. In the intervening period, the Technological Universities Transformations Fund (TUTF) has been developed, recognising the support needed in the birth of the new TUs and the role that the technological higher education sector plays in economic growth. This submission builds on that funding initiative with the objective of providing long term investment to mainstream key activities as the new TUs enable and drive forward growth and development.

Covid-19 has changed the emphases in some of those previously identified priorities, but more importantly, it has demonstrated the real urgency needed to address the issues, most particularly to deliver on the Government's priorities for coherent regional development and to enhance the capability for accessible life-long responsive learning delivered through a blended approach both online and on-campus across the full range of disciplines. The importance of education in the national recovery has been prioritised by IBEC in their submission for Budget 2021[3], and in particular they point to the National Economic Plan for sustained investment in our education and training systems and supports to boost Ireland's capacity for innovation.

The value for money of the investment proposed in this submission can be measured in terms of the delivery of national policies and this submission provides examples of how the sector has already delivered in these areas and continues to do so. Through such investment, the technological higher education sector is committing to delivering relevant engagement with regional enterprises, effective research with businesses, and a new teaching and learning digital platform that gives greater access to higher education, meets the flexible learning needs of students, ensures supports for student well-being and delivers talented graduates that provide the human capital needed to rebuild and grow the Irish economy. In order to deliver on this commitment, the funding sought requires investment in infrastructure (physical facilities and digital systems) and in human resources.

In each Chapter, the nature of the investment is identified for the domains discussed. Given the wide range of activities carried out by, and expected of, the technological higher education sector there are overarching investment requirements that span all domains – for example digitalisation and human capital. In all cases, the investment is intended to meet Government priorities for higher education and research and in particular, to enhance the student learning experience through new student supports, upgrading digital and physical equipment and human capital developments – with the objective of ensuring graduates with the talent capable of transforming and sustaining the

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[3] https://www.ibec.ie/influencing-for-business/ibec-campaigns/budget-2021

country. Chapter 1 introduces the theme of a sector in transition with the creation of new technological universities and meeting the challenges of the COVID-19 crisis which together emphasise the need for investment in digitisation and equipment. In Chapter 2, we discuss the important role that the sector plays in regional development and ways in which this can be enhanced. We return to the issue of digitisation and the new teaching and learning paradigm in Chapter 3, while also focussing closely on the improvements necessary to student supports in areas such as mental health supports and student accommodation. Chapter 4 addresses the human capital investment requirements with a particular focus on the need for further investment in staff development measures to assist with a sector in transition, including in relation to equality, diversity and inclusion. The requirement for investment in research and innovation in order for technological universities to meet their full potential as set out in legislation and Government priorities is the key feature of Chapter 5. Finally, in Chapter 6, we set out the role that the sector can play in addressing the generational challenge of climate change. Throughout the document, there are synergies and crossovers between the chapters and the four pillars that together present the overall concept of a sector that is ready, willing and able to lead in developing resilient communities, regions and enterprises.

In the overall summary table below, the investment profile is presented across the four pillars covered in the submission, showing a breakdown by key measures proposed under each of the pillars. The following table sets out the details of a total required investment of €534.2 million over a three-year period (this table is also reproduced in Appendix 2):

	Specific Measures	2021	2022	2023	Total
Pillar 1		€m	€m	€m	€m
Digitalisation and Infrastructure	Systems upgrade and future proofing including security	12.5	18	23	53.5
	Educational delivery platform upgrade and expansion	12	16.5	21.5	50
	Sub Total	**24.5**	**34.5**	**44.5**	**103.5**
Pillar 2					
Human Capital	Student health	5	12	18	35
	Support staffing and staff professional development	15	18	22	55
	Embedding equality diversity and inclusion	9	12	16	37
	Sub Total	**29**	**42**	**56**	**127**
Pillar 3					
Research and Innovation	RDI capacity building fund	20	20	27	67
	Continued RFAM reform	15	25	40	80
	IReL reform	2	4	5	11
	Regional enterprise engagement	10	10	10	30
	Sub Total	**47**	**59**	**82**	**188**
Pillar 4					
Climate	Campus Green Flag	12	13.4	18.5	43.9
	HEI buildings climate retrofitting & upgrade fund	23	22.8	26	71.8
	Sub Total	**35**	**36.2**	**44.5**	**115.7**
Overall Sector Total		**135.5**	**171.7**	**227**	**534.2**

The amounts presented in the table should be read as representing the ambition of the sector and the scale of the investment (not the detail) required for national budget purposes to place the sector in a position to deliver national policies and strategies effectively and rapidly.

Chapter 1: Realising Technological Higher Education

1.1 Context: A Sector in Transition

Most institutes of technology are now engaged in a consortium seeking designation as a technological university (TU). This is a key priority for the government, as the Programme for Government notes:

> *"The creation of Technological Universities (TUs) is a radical reconfiguration of the Higher Education landscape and will deliver significant advantages to national priorities in relation to Higher Education access, research-informed teaching and learning excellence, as well as supporting enterprise and regional development. We will support the recently established TUs and work closely with consortia to establish new TUs. In particular, we recognise the urgency attached to the establishment of the TU of the south east of Ireland."*

Furthermore, the new Department of Further and Higher Education, Research, Innovation and Science and the Higher Education Authority have expressed a desire that all existing institutes of technology will be part of a TU by 2023. This budget submission sets out some of the necessary steps required to ensure that the institutes and the nascent technological universities are in a position to achieve the goals of the Programme for Government. We have identified a number of key areas for investment. In doing so, we are not just looking at investment through additional funds; investment through people and investment through policy changes are also required. The objectives for technological universities require deepening the involvement in regional development and engagement for economic growth, greater social inclusion through access to higher education and increasing the international reach in research and education collaborations. The technological higher education sector has particularly strong relationships with further education and training; the June 2020 report[4] from the FET-HE Transitions Reform Sub-Group notes that "*current levels of progression from FET to higher education are significant, and higher than originally thought*". The sector is committed to further strengthening relationships with the further education sector in order to maximise the potential of tertiary education to meet the talent needs of the country.

The THEA submission to government for the 2019 budget identified four areas for impact:

1. underpinning regional economic development
2. providing a high-quality public service
3. preparing for the impact of Brexit, and
4. being climate change ready.

These four pillars strongly align with the impact expected from the technological higher education sector in the National Development Plan. The 2019 submission focussed on capacity building to future-proof the sector for the challenges and opportunities of 2030, with particular emphasis on digitalisation, STEM education, strategic leadership and operational capacity building and smart building and sustainable building development. The sector acknowledges that these proposals were actioned both by the sector and the department as is evidenced by the TURN report and the TUTF both of which recognise the impact that the technological higher education sector has on driving economic growth.

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[4] https://www.solas.ie/f/70398/x/b63d2338fd/des-transitions-sub-group-working-paper-june-2020.pdf

The academic year 2019-2020 brought about unprecedented changes for the technological higher education sector. The TURN report[5] launched in November 2019 put the development of technological universities centre stage as a strategic objective for higher education. Since then, a brand-new Department of Further and Higher Education, Research, Innovation and Science was created, with a clear and strong message that the government was putting higher education to the forefront in the national economic recovery drive. Of course, the changes brought about by the onset of the Covid-19 pandemic since Spring 2020 dwarfed other changes, leading to the single biggest impact on the continued ability of the technological higher education sector to contribute to regional economic growth and to enhanced student access to higher education.

This request for long term strategic investment in the technological higher education sector is driven by the publicly acknowledged essential role that the sector plays in delivering national policies. The value of the investment is not about building larger education institutions but is intended to bring about the changes required to provide the talent to achieve the ambitious national objectives for balanced regional development and economic, social and cultural growth of the country.

1.2 Budget Implications of a Covid-19 World

THEA's submission to the Department in July 2020 suggested that the sector would need €108 million in 2020 to deal with issues arising from Covid-19 including areas such as facilities management, IT security and support for Emergency Remote Teaching, e-publications, research & innovation and student support. Those costs did not include the income lost due to reductions in international student numbers, or income from business and innovation activity such as on-campus incubators and facility. These extra costs and income loss all occurred against the background of the November 2016 Financial Review of the institutes of technology completed by the HEA[6]. That Review found that

> "*As might be expected, the combination of a reduction of 34% in state support for the sector between 2008 and 2015, and an increase of 24% in student numbers has taken its toll on the finances of the sector. Ten of the 14 Institutes face particular challenges.*"

In particular, it noted that the cash flow position across the sector is a major concern and that the sector is in deficit and this trend is projected to continue over the next 5 years. Consequently, the financial challenges posed by Covid-19 could not have arrived at a worse time for the sector.

At the same time, the supports provided to the sector under the July Stimulus must be acknowledged, and it is estimated that the sector will receive approximately €70m from the disbursement of these funds. However, this falls short of the costs identified to date and does not address the potential income loss. The challenges of how to provide education and training in a Covid-19 environment are considerable and will continue into the future. The sector remain strongly committed to its learners and that all students are supported to the greatest extent possible.

This submission focusses mainly on the strategic priority of the technological higher education sector to contribute to rebuilding the economy and to reimagine higher education into the future. To achieve these goals, there will be a need for substantial investment in the period 2021-2023 to rebuild and grow the economy and to reposition and upskill for new opportunities while also dealing with the immediate effects of Covid-19 (detailed work is ongoing with the HEA to identify the actual

[5] https://hea.ie/technological_universities/tu-research-network-turn/
[6] https://hea.ie/2016/11/03/financial-review-of-the-institutes-of-technology/

costs involved as they materialise but a contingency provision must be made as part of Budget 2021 to match the July stimulus amount, with a clear caveat that the final cost may well be greater).

1.2.1 Upgrading our systems and equipment base to effectively learn and work as emerging technological universities

The investment needs of the TUs in transition is being addressed through the TUTF funding. However, in order that the emerging new technological higher education sector can provide a long term robust contribution to national recovery from Covid-19 and to support economic growth, investment will be required over many year in order to mainstream a high level ICT platform and teaching equipment base.

The technological higher education sector needs investment in its digital infrastructure in order to provide a flexible, accessible education platform, and to be enabled to engage effectively with regional stakeholders in delivering on the national policies and ambitions. What is required is an ICT architecture that will lead to improvements in learning environment, increased student success, enhanced graduate attributes, improved retention and a regional development dividend. The need for digitalisation of the sector has been well articulated elsewhere (e.g. TURN report, 2019 budget submission) and Covid-19 experience has highlighted the urgent need for significant upgrades to the ICT infrastructure. In parallel with this necessary investment is the funding of continuing upgrades to systems, such as COREHR™, BANNER™, AGRESSO™ and others, the budgetary need for which is being addressed separately by Educampus. The scale of investment required to ensure that the technological higher education sector can operate effectively will vary between institutions but will require, in any case, a multi-annual investment plan.

The teaching and learning environment is evolving rapidly. In the course of the last 6 months, phrases such as 'virtual laboratories' and 'online simulations' have become the norm. The relevance of this to the world of work is in ensuring that the graduates from the technological higher education sector can quickly and effectively apply their talent– such as operating in an industry 4.0 context or on multi-national projects across different time zones. Investment is needed to ensure that the sector can provide graduates with the knowledge, skills and competencies demanded of modern work environments. Some of this can be done though investment in systems and facilities to support virtual and remote learning. At the physical level, there will be an on-going requirement to teach face-to-face; to demonstrate, and to educate students to become proficient in the use of scientific and technological equipment. Recent investment in equipment for the trades is noted, but there is a deficit of cutting-edge educational equipment across the technological higher education system for programmes leading to professional qualifications, particularly in the STEM subjects. Investment in such equipment would enable research, significantly enhanced engagement with industry and international partners, increase work-readiness of graduates, and lead to a regional development dividend.

1.2.2 Ongoing impact of Covid-19 on research and innovation

The area of research and innovation is one that continues to be strongly impacted by the pandemic. During the lockdown period, researchers (staff and research postgraduate students) pivoted, as far as possible, to desk-based work carried out from home. After the commencement of Phase 1 of the government re-opening roadmap, and the publication of the Return to Work Safely Protocol, HEIs put in place a phased return of researchers to campus. However, the requirements around social distancing mean it is not possible to provide the same level of access to research facilities as existed prior to the pandemic. Naturally, it very much depends on the available space. In some research facilities, there may be as much as a 75% reduction in physical capacity. The use of booking facilities and access rotas are helpful. However, it is clear that some researchers will experience delays in

gathering research data which will delay the completion of projects / studies. Delays in gathering research data will not only affect students/projects due to complete in 2020; for example, a research student who began in September 2019 on a four-year PhD programme may not request an extension until as late as 2023. The same applies to research projects. Reduced access to research facilities including libraries, as a result of social distancing requirements, will require the sector to invest in additional electronic resources. These include virtual lab-books and online access to research publications, the latter becoming an even more pressing issue due to the pandemic. This is outlined in more detail in Chapter 5.

The sector faces additional challenges in relation to collaborative research and consultancy work with industry partners. Indications are that industry partners are dropping out of project which require match-funding. Institutions are faced with the choice of cancelling these projects early (with the associated negative implications for the research staff and students), or using their own resources to bring them to completion. The on-going challenge in achieving face-to-face engagements with industry partners is having a negative effect on the pipeline of industry projects, which may lead to loss of research staff in the future.

1.3 Investment Requirements

An overarching challenge is to ensure that the learning outcomes of programmes are being achieved so that the graduate will have the talent needed by the business community in a post-Covid-19 world. This challenge will be met through greater levels of digital infrastructure. Some of the emerging areas requiring funding relate to providing access to robust broadband and the management of ICT and related technology provision which is accessible to all students and staff.

As TUs are created, additional investment is required to assist them to embed the characteristics of technological university status, maintaining comprehensive education and training provision across levels 6 to 10 of the National Framework of Qualification, and playing increasingly leading roles regionally, nationally and internationally. To achieve these objectives, investment will be required over the coming years for teaching and learning equipment in order to ensure graduates are skilled in modern work-place practices.

The investment measures required to support the key priorities for the technological higher education sector identified in this chapter are summarized below and are linked to one of the four overarching pillars of the submission, and with an indication of how this supports national policies and objectives.

Requirement	Pillar	Link to National Policy
Digital equipment to meet remote learning demands	Digitalisation and Infrastructure	TURN report
World of work level equipment for teaching	Digitalisation and Infrastructure	Investing in National Ambition: A Strategy for Funding HE Enterprise 2025

1.3.1 Other sources of funding

The state is providing a number of funding sources for the technological higher education sector. Over the past few years there has been Landscape Funding for TU consortia. The HEA provided funding under the Innovation projects to the HE sector and the Human Capital Initiative fund has

four pillars under which funding can be awarded. There is also a current call for 3 year funding under the TU Transformation Fund scheme. Funding has been provided under the July Stimulus package in recognition of the seen and unseen costs of dealing with Covid-19. These are all responses to particular government policies.

The request in this submission is targeted at longer-term capacity building for the technological higher education sector. As institutes of technology transition to TUs and as the expectations of higher education as a driver of economic development becomes more explicit, the sector needs to be equipped to deliver to this ambition. The capacity building investment being requested in the submission can be categorised under four key headings, namely **Digitalisation and Infrastructure, Human Capital, Research and Innovation, and Climate**. In addition, a range of specific measures are suggested under each of these headings. The request does not overlap with other available funds and support initiatives, but rather takes a longer term perspective with the intention of preparing TUs for the future, ensuring that they can reach their 10 year targets and can more strongly deliver to regional economic growth and greater social inclusion.

The sector also requires the ability to engage with commercial entities and/or EIB funding in order to source funding for future capital investments. The submission acknowledges the intention of Government to address wider issues such as the implementation of the Cassells Report and the implementation of the findings of the RFAM report, including the creation of a suitable funding weighting for access. These issues remain critical and will continue to be addressed elsewhere.

Chapter 2: The Regional Role of the Technological Higher Education Sector

National policy has consistently identified the importance of a strategic regional focus and the role of the technological higher education sector in delivering and implementing such policy. This focus is highlighted in a number of key documents as summarised here.

2.1 Programme for Government 2020

The *Programme for Government 2020: Our Shared Future* outlines 12 Missions for the strategic development of Ireland's society and economy. The opening section of the document underlines the importance of regional development to the Programme for Government, stating:

> *"The programme has balanced regional development at its heart because all parts of Ireland must thrive if we are to prosper as a country."*

The Programme for Government also reaffirms the commitment of the new government to *Project Ireland 2040* and the associated *National Development Plan 2018—2027*, particularly in terms of their potential impact on supporting economic and societal growth across all regions of Ireland. A renewed focus on the regions is evident in a range of national policies and strategies developed by the previous Government, including the national enterprise strategy *Enterprise 2025 Renewed* and the associated *Regional Enterprise Plans*, *Future Jobs Ireland 2019* and the *Action Plan for Education 2019*. It is expected that future strategies to be developed by the new Government, including the successor to *Innovation 2020*, Ireland's national research and innovation strategy, will incorporate a similar regional dimension with a focus on more growth outside of the greater Dublin area.

The technological universities are key to the pursuit of balanced regional development. The Programme commits to developing the cities of Cork, Waterford, Limerick and Galway as viable alternatives to Dublin and a number of regional growth centres. The commitment in *Project Ireland 2040* is to provide the investment to help regional towns prosper. With our regional spread across the country, only the technological universities are in a position to deliver on the educational aspects of this objective. For example, the aims of the National Economic Plan as set out in the Programme for Government include, inter alia,

> *"Publish a Regional Technology and Clustering Programme to strengthen the links between SMEs, Educational Training Boards, multi-national corporations and third level educational institutions and help drive competitiveness, productivity, and innovation in the regions"*

> *"Further promote a culture of lifelong learning within the workforce, focusing on increasing the lifelong learning rate from 9% currently to 18% by 2025."*

> *"In consultation with stakeholders, seek to utilise the surplus from the National Training Fund to implement an upskilling and reskilling programme along with the additional funding for Further and Higher Education institutions."*

Project Ireland 2040 itself places higher education and technological universities at the centre of several National Strategic Outcomes and National Policy Objectives. For example:

- In relation to National Policy Objective 5: 'Develop cities and towns of sufficient scale and quality to compete internationally and to be drivers of national and regional growth, investment and prosperity', higher education is noted for providing "*a steady stream of local talent and innovation*".
- National Strategic Outcome 6: 'A Strong Economy Supported by Enterprise, Innovation and Skills', highlights the role of higher education in "*sustaining talent and boosting human*

capital in all regions" and "*supporting entrepreneurialism and building competitive clusters*".
institutes of technology are singled out for a central role in supporting enterprise by assisting
with "building competitive regional clusters".

- Under National Strategic Outcome 10: 'Access to Quality Childcare, Education and Health
Services' *Project Ireland* 2040 sets a goal to: "*Expand and consolidate third-level facilities at
locations where this will further strengthen the capacity of those institutions to deliver the
talent necessary to drive economic and social development in the regions.*"

- Under National Policy Objective 31: 'Prioritise the alignment of targeted and planned
population and employment growth', it states: "*In the Higher Education sector, the
development of technological universities has the potential to deliver greater opportunity to
students in the regions served, to staff working in the institutions, and to the broader local
economy and society. By creating institutions of scale and strength, multi-campus
technological universities will bring greater social and economic benefits to their regions
through a strengthened role in research and innovation and the delivery of a broad range of
high quality education and training in each of their campuses.*"

To complement this, the *National Development Plan 2018-2027* lists "*Enabling emergence of
technological universities*" as a Strategic Investment Priority under National Strategic Outcome 6: 'A
Strong Economy Supported by Enterprise, Innovation and Skills'.

2.2 Technological Universities – Drivers of Economic and Societal Development

The idea of institutes of technology merging and applying for TU designation was put forward in
2011 in the *National Strategy for Higher Education to 2030*. The required legislation was put in place
in 2018. Munster Technological University will become Ireland's second TU in January 2020, and
there are currently three consortia of institutes of technology working towards TU designation:

- Technological University of the South East – WIT and IT Carlow
- Connacht-Ulster Alliance – LYIT, GMIT and IT Sligo
- AIT-LIT Consortium – AIT and LIT

The distinctive concept of Irish technological universities is clearly described in the 2019 *Report of
the Technological Universities Research Network to the Department of Education and Skills* ("TURN
Report"):

> "….*the Irish technological university concept is distinctive in its rootedness in regional and
> local communities and economies, reaching out internationally from those roots and
> drawing international education and research practices directly back into the regions.*"

The TURN Report outlines a central role for technological universities in underpinning Ireland's
Skills and Human Capital Development, enabling Ireland's Digital Economy, and fuelling Balanced
Regional Development. It identifies three priority areas for investment in TUs and TU consortia:

1. Realigning the policy and funding framework for TUs
2. Building research capacity
3. Investing in digital infrastructure.

The role of TUs in delivering national policies is presented diagrammatically in the TURN report:
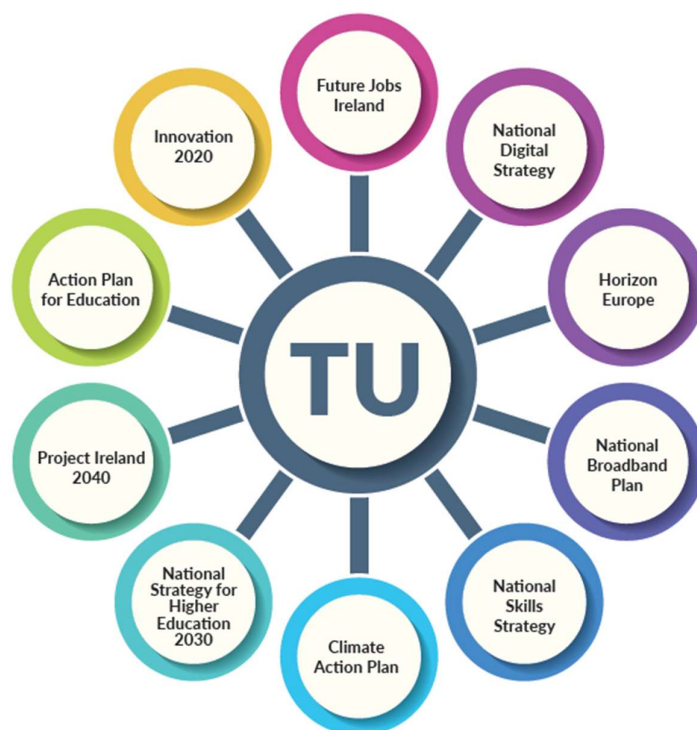
Figure 1: How a TU delivers to national policies (TURN report, 2019)

2.3 Current Regional Impact of the Technological Higher Education Sector

Engagement with regional partners is embedded in the culture of the technological higher education sector. As regional organisations which span the entire country, technological institutions play a critical function in supporting the wider economic, cultural and social development of the regions and urban areas which they serve. Our institutions have developed strong networks with partners from the private, public and civic/community sectors. A critical outcome of those networks is the ability of the sector to respond to the needs of employers in terms of producing "employment ready" graduates. The new TUs will be crucial developers of talent that will bring about balanced regional economic distribution.

The creation of Business Incubation Centres, funded by Enterprise Ireland, made a huge contribution to the ability of institutes of technology to engage and support local businesses. Each institution also engages with businesses through the Regional Skills Forum as well as other partnerships such as, for example, the Sustainable Energy Communities programme funded by the Sustainable Energy Authority of Ireland. This programme has identified more than €25m in savings for more than 80 community / civic organisations, 40 private sector companies and 30 public sector organisations. The industry-led Technology Gateway Programme provides a range of innovation solutions and support to over 2500 companies throughout the island of Ireland. Enterprise Ireland has also provided some funds for equipment related to industrial projects and for new initiatives such as Regional Technology Clusters and the Border Enterprise Development Fund. The sector's research and innovation track record, as described in Chapter 5, provides a strong platform for engagement with regional actors.

Since 2012, almost 4,000 individuals have engaged with Enterprise Ireland's New Frontiers[7] entrepreneur development programme, with 11 of 16 centres based in institutes of technology. In addition, the technological sector offers particular development opportunities informed by local needs, such as the female entrepreneurship programmes at CIT (Exxcel[8]) and the region served by the Connaught Ulster Alliance (EMPOWER)[9] or R-Innovate[10] developed by IT Carlow and Carlow County Council to address entrepreneurship in a rural environment. Each and every institution can demonstrate examples of regional impact and the small number mentioned here provide only some indication of the range of issues being addressed.

Cork IT Extended Campus

Cork IT's Extended Campus was established to act as an interface or facilitator, to create and support links between CIT, enterprise, and community groups. Its role is to make it easier for external organisations to engage with CIT in mutually beneficial interactions. Examples of interactions are available here at https://extendedcampus.cit.ie/case-studies?cYear=2020

Letterkenny IT & the Alcohol Forum

Letterkenny IT has partnered with the Alcohol Forum, a charity based in the northwest of Ireland, to develop and provide training programmes in the areas of alcohol and public health. LYIT offers a postgraduate diploma/MSc in therapeutic interventions for alcohol and other drugs for social workers, youth workers, nurses and healthcare professionals. Further details are available At http://www.alcoholforum.org/training-and-resources/

While the preceding examples provide an indication of ongoing engagement with regional stakeholders for the development of new shared intellectual capital, it is also worth noting the regional employment impact of technological higher education institutions. Available data originating from research[11] undertaken in 2017 demonstrates that 10 of the current institutes of technology are placed among the 12 highest performing institutions when state-funded higher education institutions are ranked according to greatest type II employment indicator. The paper states that "*It is clear that in locations outside of Dublin that institutes of technology are an essential part of the economies of regional Ireland".* Table 1 presents evidence of job creation in the form of employment multipliers based on each of the Irish education institutions included in the sample.

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[7] https://www.newfrontiers.ie/about
[8] https://www.rubiconcentre.ie/programmes/exxcel-female-entrepreneurship/
[9] https://www.empowerher.ie/
[10] https://www.localenterprise.ie/Carlow/News/R-Innovate-offers-innovative-solution-for-Rural-Enterprise.html
[11] Corbet and Larkin 2017 https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2948563

Table 1: Employment Multipliers (Source: Zhang, Larkin and Lucey, 2015
https://www.researchgate.net/publication/285543230)

HEI	Type I employment multipliers	Type II employment multipliers
Letterkenny Institute of Technology	1.06	8.84
Galway-Mayo Institute of Technology	1.07	8.17
Athlone Institute of Technology	1.07	8.04
Limerick Institute of Technology	1.07	7.80
Institute of Technology, Blanchardstown	1.07	7.77
Institute of Technology, Carlow	1.06	7.74
Institute of Technology, Sligo	1.07	7.70
Cork Institute of Technology	1.06	7.51
Waterford Institute of Technology	1.06	7.48
Dublin Institute of Technology	1.07	7.42
Institute of Technology, Tralee	1.06	7.30
Dundalk Institute of Technology	1.07	7.27
Trinity College Dublin	1.13	6.90
Institute of Technology Tallaght, Dublin	1.06	6.73
National University of Ireland, Galway	1.11	6.07
University College Dublin	1.16	5.82
Dún Laoghaire Institute of ADT	1.07	5.77
Dublin City University	1.13	5.65
University College Cork	1.16	5.36
University of Limerick	1.15	4.91
Maynooth University	1.09	4.45

Note: HEIs are listed in descending order for Type II employment multipliers

2.4 Investment Requirements

In their submission for Budget 2021, IBEC identified education and innovation as a key pillar to boost Ireland's capacity for innovation. To meet this demand, the technological higher education sector will need investment to increase the level of engagement with communities and local enterprises. Investment is needed for additional space in existing Business Incubation Centres to accommodate start-ups, for human resources to provide more outreach and stronger engagement with other enterprise support agencies and for new business support initiatives to facilitate outreach and engagement with local enterprises and to apply the resources of the sector in supporting regional communities.

The investment measures required to support the key priorities for the technological higher education sector identified in this chapter are summarized below and are linked to one of the 4 overarching pillars of the submission, and with an indication of how this supports national policies and objectives.

Requirement	Pillar	Link to National Policy
Teaching facilities to provide talent that meets the skills needs of enterprises **R&I capacity to support enterprises**	Digitalisation and Infrastructure Research and Innovation	Universal Design for Learning National Skills Strategy 2025 Enterprise 2025
Infrastructure and human resources to support regional enterprise engagement	Research and Innovation Human Capital	Enterprise 2025 Entrepreneurship in Ireland 2014 Innovation 2020

Chapter 3: The New Teaching and Learning Paradigm of the TU

3.1 Technological Innovation and Digital Creativity

Given the increased levels of online/blended learning taking place, support will be needed to improve the level of student retention and success. A lesson learned from the Q2 2020 Covid-19 experience is that student mentoring and monitoring is an essential requirement for success. Students cannot be expected to learn in isolation, albeit that they are working remotely; technological higher education needs to increase the resources allocated for working with students on the learning journey – not just on the academic content but in terms of time management, motivation, well-being and work-life balance.

Digital literacy skills are essential for graduates entering the workforce in the 21st century. A key enabler for this is using digital tools and applications (including virtual/augmented reality) to enhance the learning experience and create innovative opportunities for student learning, collaboration, and assessment.

Enabling digital learning for students is already being achieved to a significant extent through innovative delivery using a range of learning methods and learning supports. Ironically, the onset of the Covid-19 pandemic has accelerated the use of such supports, including teaching environments such as Teams, Zoom and Adobe Connect, Moodle, Blackboard, online mentoring, digital libraries, and greater use of continuous assessment assignments rather than terminal, formal exams.

The availability of a digital learning environment has greatly facilitated the opportunity for students to "earn and learn" by maximising the capacity for a student to engage in their digital learning environment synchronously, asynchronously, online, face to face, or via a blended array of these. There is already evidence of the increased take up on online programmes by those in the workforce.

The digital divide for categories of students came to the fore during the Covid-19 pandemic. The inherent issue of disadvantaged students not having full access to a personal computer device to complete their course work was acknowledged across the sector. Funding of such devices was recognised as essential if all students were to engage fully and equitably in new blended modes of academic delivery. While this funding provided under the July Stimulus package has been acknowledged by students, the funding of such devices is an ongoing rather than an exceptional need for many socio-economically disadvantaged students if they are to fully engage in third level studies ubiquitously and without the necessity to depend totally on the on-campus computer and connectivity provisions.

Increased access and eligibility to a range student access supports including the funding and bursary models, learning supports, are needed to ensure that disadvantaged students can adequately address both their financial and academic demands irrespectively of their mode of study.

As set out in the Programme for Government, there is a key objective to "Drive digital transformation in the public service, with greater integration of digital services". Investment in the digital infrastructure in our institutions forms a key part of this objective.

3.2 Curriculum Frameworks

The emerging attributes of TU graduates are focussing on work readiness, team competencies, communication, innovation, entrepreneurship, digital skills in addition to the discipline specific knowledge and skills. Graduates are being introduced to the world of work and their career opportunities early in their learning process.

Through the work of the THEA, SOLAS, the National Skills Council, IBEC and others, there is an ever-increasing emphasis on engaging enterprise in curriculum development and delivery. The emergence of active learning as a way to ensure that education is achieved at an experiential level and is linked to the world of work has led to the incorporation of work-placements and internships into most programmes and indeed learning through the apprenticeship model

3.3 Flexible Learning Pathways and Lifelong Learning

Technological universities will play a strong role in increasing access to higher education. This will build on the existing promotion of higher education among those who are first time to higher education in their families and among the socio-economic disadvantaged communities. The strong role of institutes of technology is, and for TUs will be, particularly relevant in the regions and in rural communities (Figure 2).
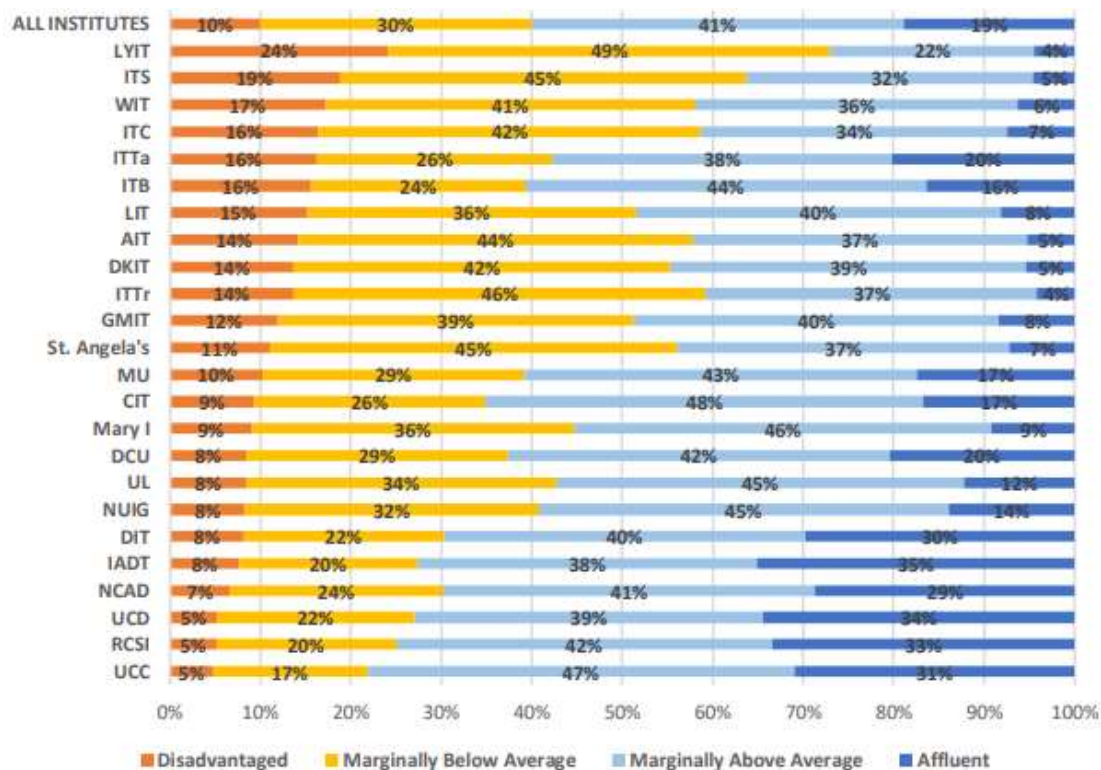
Figure 2: Deprivation Index profile of Institutes, 2017-18 (in A Spatial & Socio-Economic Profile of Higher Education Institutions in Ireland, HEA, 2019.[12]

16% of the population in the 15-64 age group are educated only to lower 2nd level[13] and many of these are in the workforce. There is a huge opportunity to develop robust and simple processes to allow access to higher education through the recognition of prior (certified and/or experiential) learning. This can be achieved through the development of, for example, portfolio mapping, the provision of innovative and flexible pathway routes (such as micro-credentials).

Indeed, in order to encourage more people to access higher education there needs to be more foundation level courses and the use of digital badges/credits to support the development of basic

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[12] https://hea.ie/assets/uploads/2019/10/Higher-Education-Spatial-Socio-Economic-Profile-Oct-2019.pdf
[13] Source: CSO

academic skills such as academic writing, information literacy, logic skills, numeracy, and research integrity.

It is important to acknowledge the various existing supports provided by the state to facilitate access to higher education[14]; the largest support being the SUSI grant scheme. The technological higher education sector has benefited enormously from this as is evident by the percentage of students registered in institutes of technology who are in receipt of SUSI grants (Table 2). Without these they would not be in a financial position to attend 3rd level education.

Table 2: Percentage of 1st year full-time undergraduate new entrants in receipt of a student grant by institute and the proportion of those in receipt of full fees, 2013/14 (in Student Grant Recipients from a First Year Full-Time Undergraduate New Entrant Cohort for the Academic Year 2013/14 in HEA Funded Institutions, HEA, 2015.[15]

Institute	% in receipt of a student grant	% of those in receipt of a student grant that are in receipt of full fees
Athlone Institute of Technology	58%	96%
Institute of Technology Blanchardstown	61%	94%
Institute of Technology Carlow	62%	94%
Cork Institute of Technology	53%	90%
Dublin Institute of Technology	42%	93%
Dundalk Institute of Technology	58%	93%
Institute of Art Design and Technology	41%	89%
Galway-Mayo Institute of Technology	60%	95%
Limerick Institute of Technology	62%	94%
Letterkenny Institute of Technology	71%	95%
Institute of Technology Sligo	64%	94%
Institute of Technology Tallaght	57%	90%
Institute of Technology Tralee	54%	93%
Waterford Institute of Technology	58%	95%
Total Institute of Technology	**56%**	**92%**
Dublin City University	36%	89%
University College Cork	34%	89%
University College Dublin	28%	90%
National University of Ireland Galway	46%	90%
Maynooth University	49%	91%
University of Limerick	48%	90%
Trinity College Dublin	24%	89%
Total Universities	**36%**	**90%**
St. Patricks College Drumcondra	36%	90%
Mary Immaculate College Limerick	43%	85%
Mater Dei Institute of Education	64%	91%
St. Angelas College Sligo	46%	87%
National College of Art and Design	41%	93%
Total Other Colleges	**41%**	**88%**

3.4 Student Body Profile

The technological higher education sector performs a unique role in Irish higher education with the overall student body being the most representative, for any institution-type, of the national population by socioeconomic status, as illustrated figure 3 which shows the deprivation index for

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[14] Funds: SUSI Grants, Student Assistance Fund, Free Fees Initiative, Back to Education Allowance, Erasmus+, HEAR & DARE and respective supports
Bursaries: 1916 Bursary, Third Level Bursary Scheme, All Ireland Scholarship, St Vincent DePaul Training Bursary
[15] http://9thlevel.ie/wp-content/uploads/susi_grant_recipients_from_a_new_entrant_cohort_for_the_academic_year_2013.pdf

Census small areas nationally compared to 2017-18 enrolments in the technological sector (HEA, 2019[16]).
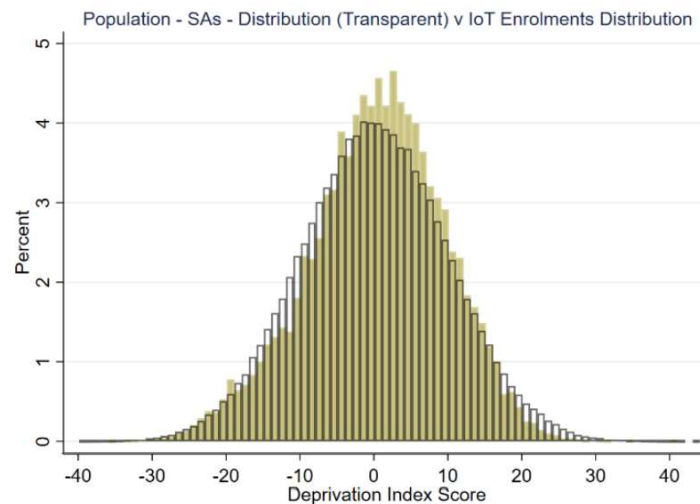
Figure 3: Small area (SA) socio-economic profile v enrolments in technological sector

The regional location of our institutions plays an important part, with the overall socioeconomic profile of individual institutions reflecting the socioeconomic makeup of their location. Resulting data demonstrates that the socioeconomic profile for nine of the eleven institutions are lower than the national figures for both mean and median. In this context, the trend in increasing enrolments over five years (nine institutes have increased student enrolments by between 2% and 32% in the period from 2014/15 to 2018/19, HEA[17]) provides an indication of the commitment of the sector to meeting national policy objectives and to providing opportunities for an increasingly diverse student body, many of whom represent students who are potentially disadvantaged, are first generation entrants to higher education, or enrolled in our sector primarily on the basis of further education and training (FET) qualifications.

Traditionally, the educational experience provided by the sector has key characteristics which are particularly supportive of our students, with successive results[18] from www.StudentSurvey.ie (the Irish Survey of Student Engagement, an annual survey of first and final year taught students, and taught postgraduate students, which began in 2013) demonstrating particularly positive feedback from students for collaborative learning, interactions with academic staff, effective teaching practices, and interactions with other students and various staff groups.

The transition to remote and hybrid modes of learning and working presents challenges for all stakeholders in education and contributes to more pressing needs and potentially increased disadvantage for certain cohorts of students, staff and local stakeholders in the technological sector; already disadvantaged learners suffer additional lack of access to devices / reliable broadband, poor study environments, multiple family members using few devices, reduced access to on-campus and face to face services. While the rapid changes required in response to Covid-19 have prompted a sharper focus on the needs of students in an emergency response scenario, the underlying

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[16] https://hea.ie/2019/10/21/higher-education-spatial-socio-economic-profile-2017-18-enrolments-published/
[17] https://hea.ie/statistics/data-for-download-and-visualisations/enrolments/enrolments-detailed-5yeartrend-dashboard/
[18] http://studentsurvey.ie/reports/studentsurveyie-national-report-2019

challenges are likely to remain in place when (eventually) an acceptable longer-term national public health response has been determined.

In planning for the future, it is critical that the technological higher education sector is enabled to build upon existing good practice by maintaining effective interpersonal interactions between students and staff, by making effective uses of data to identify potential engagement / learning issues at early stages, and by having capacity to deal with students in a manner which recognises their individual circumstances in order to maximise the opportunities offered to them.

3.5 Student Health and Personal Development

In recent years there has been a growing appreciation of the need for education providers to ensure a healthy campus. In additional to the physical environment, the mental and personal health needs are coming to the fore – as is evident through the Consent Framework, Mental Health Provisions, Psychological Capital Training Programme and Pastoral Care.

There has been a noticeable increase in recent years in the demand for mental health services to be provided by institutes of technology – for personal issues that go well beyond the classroom to, for example, personal problems in the past, life stresses, peer pressures and sexual harassment. A specific further and higher education working group, convened as part of the Covid-19 response structures, focussed on mitigating educational disadvantage and has published a series of draft discussion documents to capture related issues. One such paper examined mental health and wellbeing[19] and identified the importance of individual contact with vulnerable students in order to build resilience and to signpost existing supports. Another paper in the series examined student engagement[20], noting that

> *"Relationships with tutors, staff and institutions is an essential part of the learning experience and support framework for students. Immediate and continued contact must be in place with resources and policies developed to support staff engaging students."*

The publication in June 2020 of the Government's new strategy for mental health services - "Sharing the Vision – a Mental Health Policy for Everyone" (a key cornerstone of the Programme for Government) has identified the need to urgently address the issues facing young adults:

> *"At present, young people make the transition to adult services at the age of 18. This can be an age in life when change, uncertainty and vulnerabilities prevail. Failure to secure a safe transition can lead to disengagement and ultimately to poorer health outcomes."*

The crucial issue identified is the transition from child and adolescent mental health services to adult ones. However, the report limited its view to that aspect, without a more in-depth consideration of the challenges facing young people at that time of their life. Higher Education Institutions are at the nexus of the transition from child to adult. In particular, the institutes of technology and TUs, with their particular profile of students, are critical in assisting students struggling with the mental health challenges in that transition from child to adult.

Recommendation No.16 of that Report provides that "*Access to a range of counselling supports and talk therapies in the community/primary care should be available on the basis of identified need so*

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[19] https://www.aontas.com/assets/resources/AONTAS-Research/Student%20Mental%20Health%20and%20Wellbeing%20and%20Covid-19.pdf
[20] https://www.aontas.com/assets/resources/AONTAS-Research/Student%20Engagement.pdf

that all individuals, across the lifespan, with a mild to-moderate mental health difficulty can receive prompt access to accessible care through their GP/ Primary Care Centre. Counselling supports and talk therapies must be delivered by appropriately qualified and accredited professionals."

When considering this recommendation, in the context of the identified challenge of moving from child to adult, together with the student profile of the technological higher education sector, there is a compelling case for further investment in student counselling services in our institutions.

Students are also helping one another on campus, as promoted jointly by the Institutions and the Student Unions, through programmes such as Peer Assisted Student Support (PASS), Peer Assisted Learning (PAL) and Student Digital Ambassadors. While these typically operate on a low budget, there is a growing body of evidence that they are effective in student success and improved retention.

3.6 Emerging Student Accommodation Requirements

The significant increase in demand for higher education places over the past decade is projected to continue beyond the mid-2020s. This has had a very positive impact on Irish economic performance through the supply of well-educated and skilled graduates to meet the demand of the labour market.

However, this increase in student numbers, including international students, is creating an unprecedented demand for suitable, affordable student accommodation. HEIs report that international students demand guaranteed accommodation for at least the first year at time of recruitment. Continued increases in international student numbers, combined with the impact of increased domestic student numbers, will put further pressure on availability of student accommodation. The following sets out a profile of demand over supply in a number of locations.
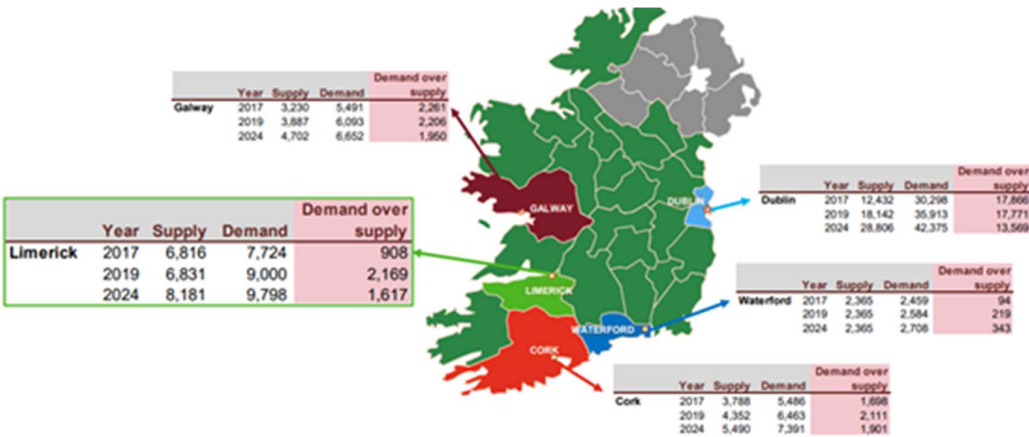

Galway

Year	Supply	Demand	Demand over supply
2017	3,230	5,491	2,261
2019	3,887	6,093	2,206
2024	4,702	6,652	1,950

Limerick

Year	Supply	Demand	Demand over supply
2017	6,816	7,724	908
2019	6,831	9,000	2,169
2024	8,181	9,798	1,617

Dublin

Year	Supply	Demand	Demand over supply
2017	12,432	30,298	17,866
2019	18,142	35,913	17,771
2024	28,806	42,375	13,569

Waterford

Year	Supply	Demand	Demand over supply
2017	2,365	2,459	94
2019	2,365	2,584	219
2024	2,365	2,708	343

Cork

Year	Supply	Demand	Demand over supply
2017	3,788	5,486	1,698
2019	4,352	6,463	2,111
2024	5,490	7,391	1,901

Figure 5: See National Student Accommodation Strategy, 2017[21]

Given the level of student households in the private rented sector and the projected increase in student numbers over the coming years, increasing the supply of on-campus purpose-built student accommodation could relieve the pressure on the private rented market. The National Student Accommodation Strategy states that there are strong levels of demand that students generally

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[21] National Student Accommodation Strategy 2017 https://www.education.ie/en/Publications/Policy-Reports/National-Student-Accommodation-Policy.pdf

would prefer to reside in on-campus accommodation and research internationally has shown that students living in on-campus accommodation have higher retention rates than commuter students, and also exhibit higher scores on developmental scales.

While the current COVID-19 issues prevail, the short-term student accommodation will have operating challenges in 2020/2021. However, the overall trend and trajectory of excess of demand over supply is significant and will become a significant issue for future TUs.

The issue that exists is a structural one where a detailed framework is in place under EU law and implemented at national level, for classifying what entities in the Irish economy are part of or outside of the general Government sector and how their expenditure impacts on the general Government balance. For example, borrowings by Universities are off-Government Balance Sheet and do not impact on general Government debt.

This reflects a combination of the autonomy of the traditional universities and their capacity to generate own income. However, these considerations do not apply to institutes of technology or as it stands to the TUs. Unlike the traditional universities they are classified as inside general Government. Consequently, institute of technology and TU expenditure/borrowing impacts on the general Government balance and their borrowing contributes to the general Government debt.

It is imperative to remove future restrictions on the technological higher education sector so that an appropriate borrowing framework (which may initially be limited to commercial/self-funding capital opportunities such as student accommodation) can be developed and implemented.

3.7 Investment Requirements

In the area of student supports, there is a need for investment to implement strategies for student success and to provide the professional health services the infrastructure required to ensure the coordinated management of services including medical, mental, gender, and sexual health; counselling, psychology, and wellbeing.

Given the increase in online/blended learning as the new norm there is a need for new roles such as student mentor/advisor to augment the formal teaching. With the increased demand for TUs to develop talent that is work-ready, the career and employment guidance services need to have greater prominence in the development of student career opportunities. Specifically, in relation to consent, additional funding would greatly assist the provision of online consent training for all incoming students (c.f. section 4.3).

Specific investment is needed to provide mental health supports. These include increasing counselling services to cover the range and reach of student counselling needs, the development of a Framework for Mental Health at Third level, development of an integrated model of student mental health care, implementing Student Mental Health Training Programme, training of staff to deal with signs of mental health problems or referring students with mental health difficulties. In the wider learning domain, there is a need to build student resilience and to develop their psychological capital by providing resilience training and Accredited Wellbeing modules to promote resilience and wellbeing.

Budget 2020 made a provision for funding of €2 million for student mental health and wellbeing initiatives in the higher education sector. This was subsumed into a larger package of €5 million as announced by Minister Harris in August 2020 as part of the response to Covid-19. However, this funding is not sufficient to achieve the long term step-change necessary for student mental health services, and in the distribution, the funding did not take account of the historical situation whereby student mental health services have been significantly under-funded in the sector relative to the

university sector, even before considering the differences in student profile. For 2021, a further €5 million is needed to address that historical under-provision. Further funding should be provided over the following two years to support the implementation of the forthcoming "National Student Mental Health and Suicide Prevention Framework".

The investment measures required to support the key priorities for the technological higher education sector identified in this chapter are summarized below and are linked to one of the 4 overarching pillars of the submission, and with an indication of how this supports national policies and objectives.

Requirement	Pillar	Link to National Policy
Enabling student access and success	Digitalisation and Infrastructure	National plan for equity of access to higher education Investing in National Ambition: A Strategy for Funding HE
Resources to provide effective student support, mental health and well-being services **Staff development at all levels**	Human Capital	Learner Mental Health and Wellbeing and COVID-19, AONTAS, May 2020 Higher Education Spatial socio-economic profile 2017-18 Investing in National Ambition: A Strategy for Funding HE
To introduce funding or borrowing arrangements to facilitate the provision of accommodation for students of TUs	Digitalisation and Infrastructure	National Student Accommodation Strategy 2017 National plan for equity of access to higher education

Chapter 4: Human Capital Development

The frequently identified importance of a strategic regional focus is outlined in Chapter 2 of this submission. As noted, the technological higher education sector has a number of unique aspects to our provision which are particularly important in the context of the current societal upheaval and consequential economic challenges. These include:

- Regional dispersal
- Range of programmes offered and the involvement of employers in their design
- Agility and flexibility of programme offerings (Apprenticeship, L6-L10 of the NFQ, Springboard)
- Applied nature of programme offer and the proximity to industry
- Close student contact and management of the learning process – Quality & Quantity

Development of human capital in this submission is presented through the lens of resilience for individuals, learning organisations, local communities, and regions.

The technological higher education sector consists of a series of relatively large learning organisations, sharing many characteristics and yet each maintaining a unique identity, which are regionally dispersed. Facilitated, supported and challenged by academic and professional services staff, students of all ages and backgrounds engage with our institutions to progress their learning, to develop their understanding, and to enhance their employment opportunities. Human capital development is the central tenet of the sector. Students are members of both the student community and of their local communities. Graduates from our institutions find employment opportunities locally, regionally and nationally, expanding the "influential reach" of the sector.

The technological higher education sector is uniquely placed, serving a nationally representative socioeconomic cohort of students (see Figure 2) to provide wide ranging influence and impact across society as a whole. This offers a key element of future proofing our society, ensuring that capacity for self and collective efficacy, communication, team working, problem solving, and continuous improvement are embedded in our staff, students, and Institutions – with the consequential impact on society.

Figure 5 presents one interpretation of building professional resilience and illustrates, in a concise manner, the strategic intent of the technological higher education sector that has delivered strongly to students and our geographical regions for many years. It is now timely, in light of rapidly changing national needs and the emergence of unique additional challenges due to Covid-19 and escalating requirements to adequately address climate change, to explicitly adopt this strategic approach by placing resilience at the centre of learning for individuals, communities and wider society, thereby facilitating the sector to play its full part in renewal.

Figure 5: Professional resilience

This section of the submission focuses on enhancing the capacity of our institutions to maximise student success, building on pillar 3 of the 2019 submission which addressed strategic leadership and operational capacity building and with reference to Chapter 3 of this submission that articulated the need for increased student supports.

4.1 Enhancing the Capacity of Professional and Support Services in Technological Universities

When considering the development trajectory of technological higher education institutions over the upcoming multi-year period, it is appropriate to consider the rapid pace of change within the sector since the establishment of the first Regional Technical Colleges (RTCs) fifty years ago, to the establishment of a number of technological universities in the next few years. Our institutions have demonstrated the ability to deliver for our communities whilst adapting in flexible and agile ways to continuing change. They have successfully responded to national challenges despite having significantly smaller scale professional and support services compared to other higher education institutions in the state. This relates to the historical context of the sector and presents a more significant constraint than can be addressed within the overall current financial parameters of our institutions. Accordingly, the following aspects of human capital development should be viewed from the dual perspectives of developing the resilience of people within the system through targeted professional development opportunities, and of enabling the creation of additional capacity in professional and support services to ensure that all roles are facilitated to operate at appropriately strategic levels.

The issue of smaller proportions of professional and support staff is illustrated by data from the institutional profiles[22] published by the HEA, which relate to the 2016/17 academic year and remains unchanged in the most recent data derived from the gender profile of institutions[23].

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[22] https://hea.ie/assets/uploads/2019/10/Institutional-Profiles-2016-17.pdf
[23] https://hea.ie/assets/uploads/2019/07/Higher-Education-Institutional-Staff-Profiles-by-Gender-2020.pdf

Table 3: Staffing profiles in Irish HEIs, 2019[23]

2019 staff FTE	Institutes of Technology	Universities
Academic	4,068	8,926
Professional & support	2,623	7,974
Total	6,691	16,900
Ratio	0.6	0.9

While the ratio of professional support staff to academic staff is 0.9 for previously established universities, it is only 0.7 for the (then) 14 institutes of technology in 2016/17. When data is limited to the 11 current institutions addressed in this submission, the ratio (for 2016/17) falls further to 0.6. This highlights the scale of change required to enable the technological sector to deliver its potential to learners, their communities and future employers. These posts relate directly to the ability of technological higher education institutions to support students in a timely and proactive manner. The alternative is to risk individual postholders within institutions having to address a large proportion of operational issues because the current level of staffing is insufficient to optimise decision-making and service provision at appropriate levels. This gap in provision between the sectors is even more stark when you consider the different student profile where, as mentioned in the previous chapter, our sector has an increasingly diverse student body, many of whom represent students who are potentially disadvantaged, are first generation entrants to higher education, or enrolled in our sector primarily on the basis of further education and training (FET) qualifications.

One topical example of this issue has been presented by the additional Covid-19 related funding made available to support disadvantaged students in the academic year 2020-21. Significant additional funding has been provided nationally for ICT devices and for the Student Assistance Fund. The challenge presented here is that the additional supports must be managed and administered by support services, such as the access offices, which are already sufficiently busy to potentially introduce delays into students receiving the benefits. In this context, admissions offices are similarly challenged. Changes to the funding allocation models are needed to close the identified gap and ensure that our students receive services on a par with the rest of higher education.

4.2 Professional Resilience

4.2.1 Professional resilience of staff – embedding new and flexible working models

Prior to the onset of Covid-19, the technological higher education sector had displayed on numerous occasions that it had the preparedness and resilience to adapt to many circumstances. The agile actions of the sector since Covid-19 has demonstrated this in abundance. With prior investment in ICT skills for its staff and even with existing hardware and software the sector managed to move all classes, workshops, labs, etc. and staff working arrangements remotely with relatively little disruption to service. This experience identified where priority investment in Human Capital (and digital infrastructure) was necessary, to enable the sector to meet the new challenges which the pandemic has presented. With the advent of technological universities, deeper restructuring of work practices is required in order to prepare for a more embedded future in our national economy.

The sector must now invest in the preparedness of our Human Resources for the increase in digitalisation, which will in turn transform how we leverage our talent pools. Our workforce has to become more diverse, team building has to be improved, our performance during the Covid-19 lockdown must be analysed to inform improvements and most importantly, we have to embrace flexible working as the new norm.

All roles will have to be systematically assessed for their adaptability i.e. flexibility must be made dependent on the staff member's role, rather than on a person's circumstance. Flexible or remote working requires an increased level of trust by managers in their staff. This is a skill that needs further investment in as part of new Leadership Training and Skills Development.

All institutions in the sector are increasing investment in their digital infrastructure to enable more flexible working. All managers and staff will be required to be more agile in future. This requires investment in training to enable work teams to become more fluid and for skill sets to be broadened. This in turn will influence our new organisational structure in a technological university context. Reskilling can prove difficult where staff fear the effects of change, but the technological higher education sector has clearly demonstrated its adaptability to changing circumstance. Investment in future learning skills is essential to build on this adaptability.

Investment and training are required for all staff in the following skills:

- Technical skills for flexible working
- Data visualisations
- Agility
- Deploying design thinking to current roles
- Innovation

The catalyst for change among staff caused by Covid-19 must be built upon. Doing this will improve productivity for the sector. The cross sector and cross industry collaboration response during the pandemic must be reinforced. By investing in our Human Capital, the sector and the country will maintain the momentum for change that Covid-19 unintentionally brought upon us. It will also enable us to focus on the skills needed to build more robust organisations for the future.

4.2.2 Professional resilience of managers – supporting and managing staff in technological universities

In response to the pandemic lockdown, the sector moved rapidly to ensure business continuity by pivoting its employees and students to a remote working arrangement. This had positive and negative impacts on staff and students and highlighted the importance of mental wellbeing.

The sector accepts that flexible working is the new normal with a mixture of in office and remote working being applicable to both managers and employees. The rapid move to remote working has challenged the sector to think differently. Managers need training in order to increase:

- The mutual trust between manager and employee which is essential for remote working
- Management of staff remotely through usage of software to monitor staff computer activity
- The greater sense of autonomy remote working gives to employees
- Empowerment of employees
- How to manage virtual teams and projects.

Investment in training for all staff – managers and employees - is now a priority in order for the sector to increase its skill accumulation for future growth and preparedness for our new normal of flexible working.

4.2.3 Professional resilience of leaders

The challenges presented by the Covid-19 pandemic introduced unprecedented challenges and demands on leaders across society, including in higher education institutions which were already operating in a multi-faceted and particularly demanding ecosystem. Future leaders will need to be agile and responsive to the evolving needs of their regions and to the changing needs of their employees and students. To benefit from the emerging TUs across the country, the State will need

to continue the dialogue with the sector to ensure that the specific needs of each region are being met, while also ensuring the sector delivers for national policies and objectives. Leaders will need to balance the autonomy of their organisations with a level of collegiality necessary to collectively ensure that TUs are engaged with national priorities. The sector collaboration model developed by THEA will need to be reviewed and redesigned to suit the requirements of the new TUs and this will require committed involvement of senior leaders from the TU. In addition, as the TUs begin to establish and optimise their organisational structures to meet their strategic objectives, it will be important to implement a leadership development programme - building on that offered by THEA with financial support from the HEA - that will identify and support potential leaders and create senior management teams that are well trained in, and prepared for, running large educational organisations.

4.3 Resilience of Regional Communities and Enterprises

It is well recognised that there are wide economic disparities between regions across Ireland, as shown in Tables 4 and 5. The technological higher education institutions are expected to support their regional communities to build the capacity and competences to grow local economies and to provide sustainable living environments both within urban areas and across more rural communities.

Table 4: Regional Population (source CSO)

Indicator	Border	West	Dublin	Republic
Pop. 2016	394.3k	453.1k	1347.4k	4761.9k
Pop 11/16gr	0.6%	1.7%	5.8%	3.8%
Pop density	35	33	1458	70
Rural to1500	71%	62%	2%	37%
Dep. ratio	59.4%	56.0%	46.1%	52.7%
Poverty risk	26	18%	12%	16%
Med. Cards	43%	39%	28%	34%
3rd level grants	24%	22%	11%	17%
Dep. Ratio% 2036	65%	62%	47%	55.5%

Table 5: Education is a driver of regional performance

Indicator	Border	West	Dublin	Republic
Projected population changes in the period 2021-36				
15-24 year olds	-7%	+2%	+23%	+7%
Highest educational qualification (15-64 year olds)				
Primary	10%	5%	5%	5%
Lower Secondary	13%	10%	9%	11%
3rd Level	37%	47%	57%	47%
Postgraduate (or 3rd level)	8%	13%	19%	13%
Population with adult education (25-64 year olds)				
Formal	5%	8%	12%	
LLL	41%	53%	63%	

For the sector to expand its role in supporting the resilience of regional communities, it will require investment to develop its capability to engage with communities and enterprise, including investment in research and innovation capacity (see Chapter 5) and in developing the sector's network of Business Incubation Centres (see Chapter 2).

4.4 Ensuring Equality, Inclusion and Diversity is Enshrined in TU Processes

The technological higher education sector is committed to equality, diversity and inclusion (EDI) for students and staff in every area of their work. This commitment is articulated in published institutional EDI policies across the sector, which also reflect the legislative context in which institutes operate. This includes the Employment Equality Acts 1998-2011 (as amended) and the Equal Status Acts 2000-2012 (as amended) which prohibit direct and indirect discrimination, sexual harassment, harassment and victimisation in relation to nine specified equality grounds: gender, family status, civil status, sexual orientation, age, disability, religion, ethnicity and membership of the Traveller community. The *Institutes of Technology Act 2006* places obligations on Governing Bodies to promote equality, diversity and inclusion among the students and staff of Institutes, specifically with regard to gender balance, and access. The *Disability Act 2005* (as amended) places significant obligations on public bodies in terms of providing integrated access to services and information to people with disabilities, as well as promoting the employment of people with disabilities. The *Irish Human Rights and Equality Commission Act 2014* requires that in the performance of their functions public bodies shall have regard to the need to eliminate discrimination, promote equality of opportunity and treatment and protect the human rights of staff and service users.

This commitment to EDI requires a continuing evaluation of organisational cultures, policies and procedures, and how these relate to the student experience, and to academic fulfilment and career progression of colleagues.

Specific national imperatives within this broader area, such as the *Gender Action Plan 2018-2020 – Accelerating Gender Equality in Irish High Education Institutions*[24] and the *Strategic Academic Leadership Initiative*[25], have accelerated the need for the introduction of senior posts for EDI and support personnel in key areas (such as data analytics and project management) across the sector, engagement of a wide body of staff in Institutional EDI Committees and cross-institutional initiatives leading to tangible outputs and progress in a broad range of EDI priorities. The latter are an integral part of HEA-Institute Compacts and include KPIs such as progression through the AdvanceHE Athena SWAN accreditation system, incorporating overall institutional performance under the expanded Athena SWAN Charter and underpinned by Athena SWAN accreditation across a diverse range of academic and professional support services units. Investment is required to support the expansion of this work to meet national policy objectives. The most recent example of the latter includes the additional resources required to deliver on the very welcome and necessary imperatives detailed in the *Framework for Consent in Higher Education Institutions*[26].

This investment in EDI will deliver a more equal and inclusive higher education community, which will ensure that all citizens have the opportunity to develop to their maximum potential, ensuring greater economic returns to the state by increasing the productivity of all its citizens.

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[24] https://www.gov.ie/en/publication/3c3c6f-gender-action-plan-2018-2020/

[25] https://hea.ie/policy/gender/senior-academic-leadership-initiative/

[26] https://www.education.ie/en/Publications/Education-Reports/framework-for-consent-in-higher-education-institutions.pdf

4.5 Investment Requirements

The investment measures required to support the key priorities for the technological higher education sector identified in this chapter are summarized below and are linked to one of the 4 overarching pillars of the submission, and with an indication of how this supports national policies and objectives.

Requirement	Pillar/Measure	Link to National Policy
Training to build capacity and resilience of professional and support services staff, managers and lecturing staff	Human Capital	Universal Design for Learning National Skills Strategy 2025 Enterprise 2025
Support to build resilience in communities	Research and Innovation	Enterprise 2025 Entrepreneurship in Ireland 2014; see section on Innovation Innovation 2020 Project Ireland 2040
Building gender equality into culture and practice	Human Capital	Gender Action Plan 2018-2020 – Accelerating Gender Equality in Irish High Education Institutions Strategic Academic Leadership Initiative Framework for Consent in Higher Education Institutions

Chapter 5: Building Research and Innovation Capacity

As described in Chapter 2, the 2019 TURN Report outlines a central role for technological universities in underpinning Ireland's Skills and Human Capital Development, enabling Ireland's Digital Economy, and fuelling Balanced Regional Development. The report targets the acceleration of the "role, contribution, and importance of using strategically focussed research and innovation expertise to co-create and find solutions for the challenges of the 21st century" and identifies Building Research Capacity as one of three priority areas for investment in TUs and TU consortia. To give a sense of the starting point, the *Annual Knowledge Transfer Survey 2018* published by Knowledge Transfer Ireland (KTI) reports that the technological higher education sector is responsible for approximately 8.5% of national higher education research expenditure. Although this percentage has grown substantially from low single-figures in the early 2000's, it has remained largely static in recent years.

The TURN report recognises that enhanced capacity for sustainable delivery of R&I outcomes and impacts is one of the defining characteristics of a TU compared to an institute of technology. There are a number of important R&I metrics which the State has set down for TUs/TU consortia to achieve pre- and post- designation. The technological higher education sector is performing leading-edge research, internationally benchmarked via their involvement in international collaborative research projects. The sector has been particularly successful in sourcing R&I funding from Europe: according to government's biennial HERD surveys, 28% of R&I expenditure is supported by EU funds. This compares to around 15% in the traditional university sector. Participation in EU collaborative research projects allows the sector to bring international best practice in R&I into all regions of Ireland. It has also allowed the sector to develop important cross-border R&I partnerships with Northern Ireland through the Interreg and other programmes.

Although the sector has a reputation for excellence in "applied research", this is a very narrow view. The reality is that the sector is committed to leading-edge research across a broad range of Technology Readiness Levels, but always with an eye on how the knowledge generated can be put to use. This is particularly important in a rapidly changing world where not only technology, but society, is evolving faster than perhaps at any other time in human history. The pathways to putting knowledge to use are well understood by the sector because of its long history of working with external partners from industry, the public sector and society (charities, community groups, etc.). That focus on partnership and responsiveness is part of a holistic approach to external engagement. It's not simply about carrying out an R&I project for an external partner. It's about building a relationship with that partner that spans a range of activities that connect the R&I and teaching and learning aspects in the institution, e.g. student projects and placements, curriculum development, bespoke training courses and so on. The sector's reputation for delivering for external partners, in combination with their domain expertise, has led to increased involvement in the SFI Centres programme; at present seven of the sector's institutions are involved in 11 of the 16 SFI Centres. The sector's institutions are also valued partners in five of the ten EI/IDA Technology Centres.

For several years now, KTI's annual surveys have shown that the sector is responsible for around 50% of what they term 'Business Access to Research Expertise'. This is a measure of the number of research consultancy and collaborative research projects between industry and HE. Similarly, according to KTI, the sector is responsible for 22% of collaborative research and consultancy agreements with non-commercial entities in 2018, the first year that this data has been captured by KTI. Many of these projects with external partners are delivered via the Technology Gateway programme, where dedicated business development staff help attract external partners to avail of the R&I expertise in the sector. As of June 2019, the 15 Technology Gateways had completed 3,227 projects with 1,935 companies across all 32 counties on the island. Overall, the KTI data is evidence of a strong focus on external partnership in R&I. This focus complements the sector's well-known

activities in supporting budding entrepreneurs and new start-up and spin-in companies. The New Frontiers entrepreneurship development programme is run by the sector on behalf of Enterprise Ireland; between 2012 and 2019, almost 3,000 individuals completed Phase 1 of the programme.

Some of the main beneficiaries of the R&I culture in the sector are the students who choose to study for a research Masters or PhD degree in the sector. The numbers of research students have increased steadily over the past 10 years and was just over 1,000 students in the 2018/2019 academic year (10% of national total). The sector provides an important opportunity for people to begin a research career in their own locality, in addition to attracting international students. With the advent of TUs it can be anticipated that graduates with R&I experience will build resilient businesses in their communities, thereby addressing one of the major strategic objectives of successive Government planning. The partnership model described above is of significant benefit to research students: many have the opportunity to work with external partners during their studies and graduate with that "real world" experience under their belts. In a context where the overwhelming majority of PhD graduates will not have an academic career (for example, a 2017 study by Nature magazine estimated that 3-4% will secure a permanent academic post), having the opportunity to develop skills relevant to other employment sectors boosts the employability of research graduates from the sector.

5.1 A Sectoral Approach

The technological higher education sector has built up its R&I capacity despite very low levels of investment, particularly since the demise of the Programme for Research in Third Level Institutions (PRTLI). Funding for research infrastructure is difficult to source nationally since PRTLI finished, as was emphasised in the *Mid-Term Review of Innovation 2020*.[27] This problem is exacerbated for the sector as compared to the traditional universities, as the former is currently unable to borrow external funding to purchase infrastructure. This lack of fundamental infrastructure continues to place the institutes of technology and designate TUs at a disadvantage, especially in relation to certain funding agencies. For example, very modest funding is received from Science Foundation Ireland, Health Research Board and Irish Research Council. Just 4% of all IRC postgraduate scholarship holders are based in institutes of technology. Some gains in SFI funding have been made in recent years, but mainly in the SFI Centres programme where the sector's ability to bring match funding from industry helps to counterbalance the sector's inability to provide infrastructural supports. In contrast, the sector receives significant financial support from Enterprise Ireland. EI and the sector has partnered to deliver the Technology Gateway and New Frontiers programmes, and the recent Regional Technology Cluster programme. EI's broad suite of innovation and regional development programmes are an important source of R&I funding for the sector. The 2019 and 2020 EI Capital Calls for the Technology Gateways have been a crucial source of funding for state-of-the-art research infrastructure.

In 2019, the sector received its first targeted allocation for R&I through the RFAM. A sum of €5 million was made available in 2019 and again in 2020, and was distributed amongst the institutions based on a model put forward in the Review of the Allocation Model for Funding Higher Education Institutions.[28] The same report recommended that this allocation be increased over time to 5% of the overall RFAM funding for the sector (€40 million approx.). Although it is early to undertake a full evaluation of the investment, THEA has commissioned an independent rapid review (a copy of which accompanies this submission) to gather early indications of its impact on the R&I capacity of the

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[27] https://dbei.gov.ie/en/Publications/Mid-term-Review-of-Innovation-2020.html
[28] https://hea.ie/funding-governance-performance/funding/funding-review/

sector and these are very encouraging. In particular, the report has noted that the multi-annual nature of this funding is important, as it allows institutions to plan activities without having the full budget up-front. The sector appreciates the €90 million investment through the TU Transformations Fund (TUTF) which arose from the TURN Report, a portion of which is targeted at building research capacity. It is important though that the long-term multi-annual RFAM funding should not be conflated with the short-term TUTF funding which serves to address some of the key targets set down in the TU legislation.

Whilst individual institutions have their own diverse strategies for sustainable development of R&I capacity which reflects their current baseline of activity and strategic priorities, a common sectoral approach is evident. The overarching goal is to develop the necessary environment to allow research and innovation in TUs to thrive and to be sustainable in the long-term. Developing this environment will require investment in seven key areas:

1) Initiatives to support academic staff to become (more) research active, including building their experience with and expertise in supervising postgraduate research students
2) Programmes to build a critical mass of postgraduate research students, aligned with the targets in the TU legislation, including scholarship schemes and the provision of Structured Research Degree programmes in accordance with the *National Framework for Doctoral Education*[29]
3) A professional research support service, including additional specialist research office staff, to maximise competitiveness in securing competitive R&I income
4) A dedicated knowledge/technology transfer support service to facilitate engagement with industry/community partners and commercialisation of research outputs
5) Provision of research infrastructure and equipment to facilitate staff and student research activity
6) Programmes to support the career development of research staff, in line with the objectives of the *National Researcher Career Framework*
7) Access to appropriate IT and library resources to support research and innovation, e.g. full-text online access to the research literature, research funding databases, and the necessary infrastructure to support the implementation of the forthcoming national action plan for Open Research, such as data repositories and bibliometric tools to track the impact of R&I.

While each institution will have different priorities for investment, there are significant opportunities for collaboration between institutions in the above, particularly in the area of IT and library resources, which should be encouraged.

One aspect of key area (7) that requires urgent investment is providing full-text online access to the research literature. The sector is not currently a member of the Irish Research e-Library (IReL), which providing access to quality peer-reviewed online research publications, including journals, databases and index & abstracting services, as well as ebooks, for member institutions. IReL currently serves the seven Irish universities, the RCSI, Technological University Dublin City Campus (since 2018) and, for a limited number of resources, the institutes of technology. This limitation means that institutes of technology do not benefit from the collective purchasing power of IReL and must negotiate separately with the publishers. The end result is that institute of technology researchers do not enjoy the same equity of access to the online research literature as those in other Irish higher education institutions.

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[29] https://hea.ie/assets/uploads/2017/04/national_framework_for_doctoral_education_0.pdf

A review of IReL published in 2019[30] concluded that "*purchasing practices in IReL result in improved value for money*". It was found that there is a benefit of having a single entity negotiating with publishers rather than individual HEIs negotiating separately. A further finding was that equity and State VFM could be improved by facilitating all Irish HEIs to join IReL, so that they could also benefit from the advantages experienced by IReL Members. The report noted that IRel was a research enabler and that for research, and the new knowledge it produces, to have significant impact it is important that it be accessible to as broad a public as possible. In conclusion it was recommended that procurement of e-journals at a national consortium level should continue and be expanded to include the institutes of technology and other state research bodies, as financial resources permit. Implementation of the report is ongoing. It is likely that the 'onboarding' of institutes of technology into IReL will occur on a phased basis, but given that the Covid-19 pandemic has resulted in an increased need for digital resources, it is of critical importance that the necessary funding to allow institutes of technology to join is made available from 2021. The cost for a phased approach to this would be in the region of €2m in 2021, rising to €5m by 2023.

While the €5M RFAM funding for R&I and the portion of the TUTF that will be targeted towards R&I activity are extremely welcome, they will not be sufficient to address all the needs outlined above. They should form just one part of a strategic Government investment plan to develop R&I capacity in the sector, with the overall aim of improving it to the point where it can secure more competitive funding and sustain itself effectively through a combination of competitive funding and the baseline provided via the RFAM.

5.3 Investment Requirements

This submission is requesting the following multi-annual investment:

1. Recommendation 13 in the *Review of the Allocation Model for Funding Higher Education Institutions* provided that a R&I allocation to the technological higher education sector be equivalent to 5% of the total RFAM allocation – an amount approximating to just over €40 million. An initial allocation of €5 million was made in 2019 but disappointingly this was not increased in Budget 2020. We are seeking that a commitment be made to reach the target of 5% by 2023 through an increase to €15 million in 2021, €25 million in 2022 with the final increase to €40m in 2023.
2. The funding needed for institutes of technology/TUs to join the Irish Research e-Library (IReL) is made available on a phased basis starting in 2021. We estimate that this could cost in the region of €5 million for our members by 2023.
3. A ten-year R&I capacity-building fund, renewed after five years, building on the investment in the TU Transformations Fund. Similar to PRTLI, it should allow for capital expenditure on RI infrastructure including e-infrastructures, funding for research personnel (staff and students) and support staff, and for programme development, research materials etc. This funding should also support the implementation of the *National Researcher Career Framework*. Details of the 10-year fund can be found in Appendix 3.
4. A balanced higher education funding system – and, within that, higher education research funding system – is essential for future success, sustainability and resilience. The establishment of the TUs, as the most important development in the HE landscape over the next number of years provides for an opportunity to foster this balance in a regional context, particularly in the post-Covid-19 world. Bringing this balance to research funding must form a core part of the strategy of the national research funding organisations over the next few years and we would request that this becomes a high priority for the new Department.

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[30] https://hea.ie/assets/uploads/2017/04/190524_IReL-Review_Steering-Group-report_FINAL.pdf

The sector's track record demonstrates very strong potential to deliver a wide range of economic and societal impacts, particularly on the regional level. TUs have the potential to radically change the relationship between investment in R&I and the resulting outputs, driving knowledge transfer in a systematic and sustained way which can benefit employment sectors rather than individual companies, as exemplified by the Technology Gateway Programme and the Regional Technology Clusters. As stated in the TURN Report, increased investment in R&I capacity is essential to allow the institutes of technology to reach the requirements for technological university designation and to work towards the objectives and goals set out in *Project Ireland 2040* and the *Programme for Government 2020*, particularly those which aim for balanced regional development. The investment requested here will enable the establishment of TUs in every region of the country and will support them in delivering on those national strategic objectives and goals.

The investment measures required to support the key priorities for the technological higher education sector identified in this Chapter are summarized below and are linked to one of the 4 overarching pillars of the submission, and with an indication of how this supports national policies and objectives.

Requirement	Pillar/Measure	Link to National Policy
R&I allocation to the technological higher education sector of 5% of total Recurrent Grant	Research and Innovation	Mid-term Review of Innovation 2020, DBEI, 2019
Financing TU membership of the Irish Research e-Library	Research and Innovation Digitalisation and Infrastructure	Review of the Allocation Model for Funding Higher Education Institutions, HEA, 2017 Enterprise 2025 Strategic Review of the Irish Research e-Library, 2019
A ten-year R&I capacity-building fund	Research and Innovation Human Capital	Project Ireland 2040 Programme for Government 2020

Chapter 6: Supporting the Delivery of National Climate Targets

Addressing climate change is the key challenge for our generation. The technological higher education sector is committed to delivering on the ambitious targets set out in the *Climate Action Plan*[31] related to the public sector and public sector buildings. We note that the Programme for Government set out specific challenges for the public sector in that regard where it provided that the government will:

> "*Publish a new Public Sector Decarbonisation strategy for 2030. This will include the development of policies to ensure greater use of energy performance contracts within the public service. We will set a public sector decarbonisation target of at least 50%. We will also focus on a step-up in public bodies which are not on target to deliver the existing energy efficiency target of 50% do so, and work with others to go further. The Office of Government Procurement will play a key role in rolling out this strategy, through the central procurement of energy related investments and services.*"

With our presence in the regions, and our reach to learners of this and the next generation, we are in a unique position to act as an exemplar and as leaders in this change. However, that requires investment. The absence of a borrowing framework as referenced earlier in this document is an inhibitor to that change and a new policy direction is required to enable us to rise to the challenge. The substantial building stock of the sector represents a significant opportunity in terms of energy savings and carbon reduction, while also acting as living labs for our students and staff demonstrating low carbon energy solutions. While new buildings coming on stream over the coming years are being designed and will operate to the standards set within the Building Regulations, the significant investment challenge is in relation to the existing building stock. A multi-level approach is required to address this challenge and a potential model is proposed below.

- Immediate investment programme for quick win solutions targeted at projects which have fast turn around and delivery timeframes i.e. procured and delivered in 12-18 months. This would include lighting upgrades to LED, BMS/BEMS improvements and optimisation, IT Server Room and services energy saving measures etc.
- Pilot programme in 2021 to select a number of HEI buildings for decarbonisation through renewable energy solutions e.g. heat pumps, biomass, etc.
- Support programme to enable energy assessments of existing stock and investment plans to be developed targeting B energy rating standard (or higher) with a view to building a pipeline of investment projects from 2022 onwards
- Dedicated Photovoltaic (PV) installation programme for HEIs which is specifically designed to address technical challenges (high output during low occupancy periods, storage etc) and financial/economic aspects including potential integration of power supply with local communities/stakeholders
- Specific targeted initiatives through SFI, EI and others to demonstrate technical innovations across the built environment (smart insulation, advanced windows, building controls etc.)
- Engagement with DFHE, DPER, NTMA and other relevant bodies to consider application of Energy Performance Contracting (EPC) models within the HEI sector

HEIs are faced with increasing demands from staff and students to provide access to EV Charging facilities. A dedicated programme is required to support HEIs to facilitate this and contribute to the national infrastructure in this regard.

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[31] https://www.dccae.gov.ie/en-ie/climate-action/publications/Pages/Climate-Action-Plan.aspx

In the context of behaviour change and engaging with our current 64,359 students[32] and 6,691 staff (FTE)[33], the technological higher education sector will take a leadership role in informing and supporting communities to respond to the climate and energy challenges facing the country. A dedicated fund should be provided to HEIs to expand their activities and measures related to sustainability. This should build upon existing initiatives taken by HEIs in relation to smarter travel, green campus, green flag and seek to enhance the level and depth of activity. A target of 50% of all HEIs achieving Green Flag status by 2025 should be considered and supported accordingly.

It is not just in respect of ourselves and our buildings that we can offer help. The Programme for Government has set objectives for new apprenticeships to work with new technologies to mitigate the problems of climate change e.g.

> "*Commit to emphasising and building capacity for green apprenticeships through a Green Further Education and Skills Development Plan, as tackling the climate crisis will require a broad range of skills across the construction, energy and natural heritage sectors.*"

With the right investment, the technological higher education sector will collaborate with the FET sector to provide programmes for retraining and training for retrofitting in the construction sector and will explore the potential for new apprenticeships in new builds / NZEB / Passive energy.

The Programme for Government also seeks to put in place:

> "*A transformational programme of research and development to ensure Ireland is a the cutting edge of scientific and technological innovation in meeting our climate change targets, including in the bioeconomy, in marine sequestration, in green hydrogen, in wave technology, in developing floating offshore wind turbines to take advantage of the Atlantic coastline, and in agriculture to improve breeding programmes, feed additives to reduce biogenic methane, agroforestry, paludiculture and nutrient management.*"

Given the urgency for the country to take immediate and decisive action to achieve the agreed international targets for climate change, and in line with government objectives, the sector could potentially create an innovation hub for driving forward climate change at a national level, focusing on developing and applying materials, technology and systems to reduce the national carbon footprint. The sector's focus on research that generates practical outcomes and is delivered in partnership with industry, public sector and community (as outlined in Chapter 5) makes it the location of choice for such innovations.

In relation to the broader climate and biodiversity agenda our campuses present unique opportunities to contribute to the challenge of loss in species and the biodiversity emergency. The sector would benefit from investment to work with NGOs, communities and our stakeholders to utilise our estates in a sustainable manner, show casing best practice and connecting communities with the biodiversity agenda.

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[32] https://hea.ie/statistics/data-for-download-and-visualisations/enrolments/2018-19-enrolment-data-pivot/
[33] https://hea.ie/assets/uploads/2019/07/Higher-Education-Institutional-Staff-Profiles-by-Gender-2020.pdf

6.1 Investment Requirements

This submission is requesting the following multi-annual investment:

- A new multi-annual investment plan for the greening of our campuses through the multi-level plan set out above including decarbonisation, a retrofitting programme targeting B energy ratings for existing buildings, EV charging etc. This fund would be in addition to recurrent grant funding and would be specifically tailored as a HEI Buildings Climate retrofitting & Upgrade fund. We estimate that this fund would need to be set at a level of €71.8 million over three years.
- A campus Green Flag fund to enable technological universities to act as exemplars in the region and among their wider community of learners, teachers and innovators. Funding of €43.9m over three years would enable us to put this into practice.

These initiatives are designed to meet the Government's climate change objectives and to contribute positively to the regions. As discussions develop on what needs to be done to deliver on the national *Climate Action Plan*, consideration could be given to establishing a sector wide group to work on the practicalities of implementing new low-carbon technologies and systems in the construction sector.

The investment measures required to support the key priorities for the technological higher education sector identified in this chapter are summarized below and are linked to one of the 4 overarching pillars of the submission, and with an indication of how this supports national policies and objectives.

Requirement	Pillar	Link to National Policy
Greening of campuses, e.g. - **Lighting upgrades** - **Energy saving measures** - **Renewable energy solutions** - **Energy audits of existing stock**	Climate Action	Programme for Government 2020 Climate Action Plan 2019
Programmes to develop energy saving and low carbon expertise in the construction sector	Climate Action	

Appendix 1: Working Group Members

The members of the THEA working group who prepared this submission are:

1. Dr Brendan McCormack   President, IT Sligo (Chair)

2. Dr Patricia Mulcahy   President, IT Carlow

3. Jimmy Browne   Sec/FC, LIT

4. Frances O'Connell   Registrar, AIT

5. Dr Niall Smith   Head of Research, CIT

6. Ger O'Driscoll   HR Manager, DkIT

7. Dr Jennifer Brennan   Director Research, Innovation, & Engagement, THEA

8. Gearoid Hodgins   Director Corporate Affairs, THEA

9. Sean O'Reilly   Data Analyst, THEA

Appendix 2: Financial Summary

	Specific Measures	2021	2022	2023	Total
Pillar 1		**€m**	**€m**	**€m**	**€m**
Digitalisation and Infrastructure	Systems upgrade and future proofing including security	12.5	18	23	53.5
	Educational delivery platform upgrade and expansion	12	16.5	21.5	50
	Sub Total	**24.5**	**34.5**	**44.5**	**103.5**
Pillar 2					
Human Capital	Student health	5	12	18	35
	Support staffing and staff professional development	15	18	22	55
	Embedding equality diversity and inclusion	9	12	16	37
	Sub Total	**29**	**42**	**56**	**127**
Pillar 3					
Research and Innovation	RDI capacity building fund	20	20	27	67
	Continued RFAM reform	15	25	40	80
	IReL reform	2	4	5	11
	Regional enterprise engagement	10	10	10	30
	Sub Total	**47**	**59**	**82**	**188**
Pillar 4					
Climate	Campus Green Flag	12	13.4	18.5	43.9
	HEI buildings climate retrofitting & upgrade fund	23	22.8	26	71.8
	Sub Total	**35**	**36.2**	**44.5**	**115.7**
Overall Sector Total		**135.5**	**171.7**	**227**	**534.2**

Appendix 3: Research and Innovation Capacity Building Fund

This Appendix provides some additional information to illustrate the concept of the ten-year R&I capacity-building fund outlined briefly in Chapter 5. This fund would strategically build on the investment in the TU Transformations Fund. It would focus on providing the type of research infrastructure which is comparable to that available elsewhere, and which is crucial for the competitiveness of a research and innovation ecosystem. Research infrastructure can be broadly divided into six categories – (i) Buildings; (ii) Equipment; (iii) Researcher Career Development; (iv) Postgraduate Researchers; (v) e-infrastructures and (vi) central function support (notably Research Offices and Graduate Studies Offices)

The proposed ten-year plan is designed to support an R&I ecosystem **that is at the very least capable of meeting the TU criterion of having 7% of registered students at level 9/10 in each** TU. At time of application, TUs must meet a target of 4%, from which the 10-year plan must provide for a 75% increase in the number of postgraduates. The funding to support these will come significantly from external competitive sources (e.g., EI, SFI, IRC, Horizon Europe, etc.) and to be competitive the applicant researchers and research teams must have in place the necessary R&I ecosystem in the host institution – hence the funding for postgraduates is not solely directed at scholarships.

A typical trajectory for the growth in postgraduate numbers in a TU is shown in Figure 7 below, extracted from the Munster Technological University application. The figure indicates that after an initial rapid increase (phase A) upon TU designation, there is a slower increase as the research infrastructure capacity is built up (phase B), followed by sustained growth to the 7% target of postgraduate student numbers.
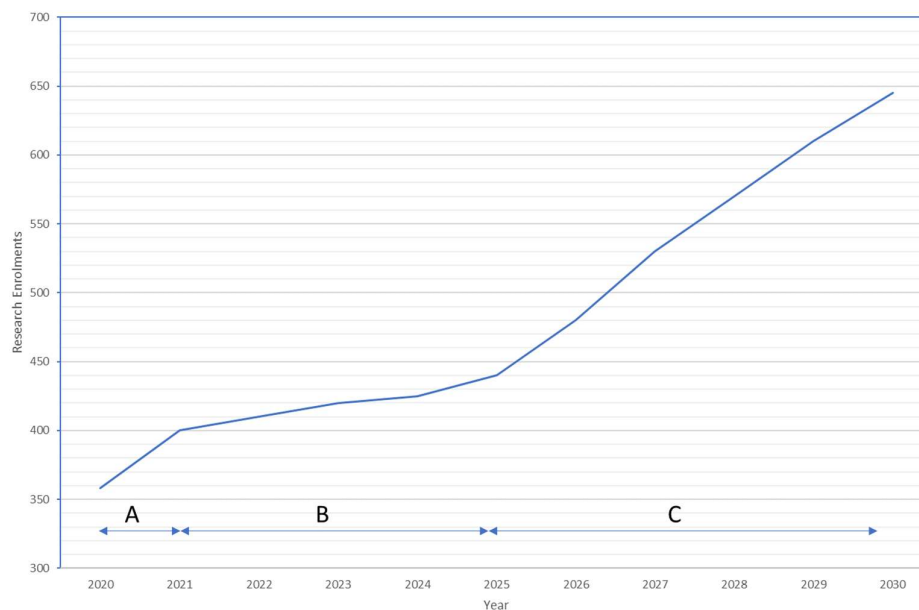
Figure 7: Typical growth trajectory in postgraduate numbers in a TU from (MTU TU application)

Each TU will have its own strategic approach to R&I growth and the rationale underpinning the ten-year plan is that it provides individual institutional flexibility within an overall budget envelope. However, it is likely that physical infrastructural projects (including refurbishment, new buildings and equipment) will be important to be approved in the early years so as to support the growth in PG research numbers and associated increase in academic staff research capacity and taught student

research experience. These will be followed by a second wave of building subject to information from the 5-year review.

Year	Focus on (indicative priority order)	M€ (per year)	Total
0-2 (Phase A)	Central Supports	4	€20m p.a.
	Researcher Career Development	4	
	e-infrastructure	2	
	Refurbishment of existing infrastructure	6	
	Postgraduate capacity building	4	
3-5 (Phase B)	New Research Infrastructure	15	€27m p.a.
	Researcher Career Development	2	
	Postgraduate capacity building	6	
	Maintenance of Central Supports	2	
	e-infrastructure	2	
Review			
6-8 (Phase C)	Postgraduate capacity building	5	€20m p.a.
	Researcher Career Development	3	
	e-infrastructure	2	
	Maintenance of research infrastructure	5	
	New Research Infrastructure	5	
9-10 (Phase C)	Postgraduate capacity building	8	€22m p.a.
	New Research Infrastructure	5	
	Researcher Career Development	2	
	e-infrastructure	2	
	Maintenance of research infrastructure	5	

In this approach there is an underlying assumption that the new TUs are able to absorb some of the costs of the multi-annual functions into the increased RFAM R&I allocation.