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Curriculum Re-definitions and Transformations: Spinning on New Axes within the Technological University

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Curriculum Re-definitions and Transformations: Spinning on New Axes within the

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Abstract

Within a technological university there is an understanding of the kind of education students

should possess on graduation. A primary consideration in such an institution is the

requirement to "transmit knowledge and universal values and, at the same time, to contribute

to the cultural, economic and social development of the local societies that they serve and that

support them". This paper explores how a curriculum can be (re)shaped in a technological

university context to address this requirement.

This paper develops and examines a possible pathway to progress the establishment of a

portfolio of academic programmes within the context of establishing a technological

university by:

1. developing a set of principles which can be used to review existing programme
    portfolios;
2. identifying a process which can be deployed to develop a cooperative model within
    each discipline to develop the portfolio of programmes while applying the general
    principle as listed at (1) above.

By transforming its curriculum the technological university will fulfil its public service

obligation to develop civic competence through the pursuit of research-that-creates-

knowledge, education-as-the-sharing-of-knowledge, and innovation-as-commitment to

engagement with clients whose focus is the local, regional, national, and international

development of Irish higher education.

Keywords: curriculum, technology, program, university, transformation, national

strategy

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Introduction: Knowledge as a Socially Distributable Commodity

In 2005 the Commission of the European Communities published a paper entitled

'Mobilising the Brainpower of Europe: Enabling Universities to make their full contribution

to the Lisbon Strategy'. It set the context for the development of a national strategy for

higher education in Ireland which was expressed in 2011 with the publication of the *National*

Strategy for Higher Education to 2030.

The focus of the national strategy envisages a situation in Ireland whereby Irish

Higher Education Institutions (HEIs) become initiators of, and at the same time response-

ready to, the opportunities which the "knowledge economy" presents in terms of equipping

graduates with high-order knowledge-based skills. It also presents the challenge to HEIs to

link high quality research to the teaching mission to contribute to current and anticipated

opportunities associated with socio-economic development domestically and internationally.

To be in a position to respond to these challenges there is a requirement for transformation in

academic communities in terms of maturing further the relationship between teaching and

learning, not alone in terms of the learning environment, but also in the curriculum model

itself. The national strategy further identifies the requirement to build capacity in the area of

research. While it recommends that research activity be more actively linked to enterprise,

there is also an unstated requirement that building research capacity ought to be a feature of

the undergraduate and postgraduate curriculum model so that knowledge, skill and

competence-based approaches evident in this model reinforce, for the learner, the "intimate

relationship between research and teaching, and the economic importance of linkages

between research and enterprise" (*National Strategy*, 2011, p. 5).

Recognising the fact that Ireland has an open economy, the strategy references the internationalisation of activities as a core activity of engagement in order to increase collaboration between countries to promote mobility between staff and students, researchers, and those involved in commercialising research.

With echoes back to the Commission's 2005 proposals that the strategic orientation of higher education is necessarily defined by the State, the *National Strategy* notes that governance, leadership and management structures must be appropriate to support the high level systems objectives it sets for the higher education institution to be a transformative influence by being globally oriented and internationally competitive.

Contained in the *National Strategy* is a proposal to establish a new type of university charged with very specific tasks. In addition to the guiding principles identified above, this new type of "technological university" will be required to focus on career-based education from levels 6-10 as well as demonstrating high levels of engagement in industry-focused research and innovation. The *National Strategy* further envisions the important role to be played by the technological university in facilitating access and progression (particularly from the workforce) by developing structured relationships with providers of further education and training, as well as providing workplace learning opportunities for students (*National Strategy,* 2011, p. 105).

Under the heading of Teaching and Learning, the *National Strategy* makes a number of recommendations of which recommendation no. 4 (item 1) will be the focus of this paper:

1. In the coming decades, the delivery of higher education in Ireland must be characterised by flexibility and innovation.[1]

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[1] This recommendation needs to be read against the s.22 (1-8) of the *Technological Universities* Bill (2015). S.22 lists the functions of a technological university *inter alia* a requirement to support entrepreneurship, enterprise development and innovation in business enterprise and the professions, through teaching and the conduct of research, and through effective transfer to those and other sectors of knowledge arising from that research. Furthermore, the technological university is required to collaborate with business, enterprise, the professions and related stakeholders regionally to promote the involvement of those stakeholders in the design

The impetus for curriculum transformation within the proposed establishment of Technological University for Dublin Alliance (TU4Dublin) stems from a commitment given effect in 2011 to create a technological university between Dublin Institute of Technology (DIT), Institute of Technology Blanchardstown (ITB), and Institute of Technology (ITT).

Since 2011 the alliance has been laying foundations to establish a technological university to transform the lives of people in the Greater Dublin Area in particular, and of Ireland, in general. Through global competitiveness, entrepreneurial behaviour, and outward focus while simultaneously conscious of its regional rootedness, the proposed technological university alliance will build on its history established as independent institutes of technology to conduct high calibre research and enterprise in response to the needs of society. Central to this endeavour is curriculum transformation and the principles which underpin it.

Principles Which Underpin Curriculum Transformation

Within the proposed technological university the approach to curriculum design recognises diverse approaches within curriculum theory that contribute positively to the complexity of curriculum design. Furthermore, a proposed Curriculum Model recognises the role that each institution's educational philosophy, culture, ethos as well as the experience of its students and all staff can make in supporting its own distinct approach to the curriculum as a technological university. This approach is characterised by the following principles:

1. **A commitment to knowledge creation, research and scholarship:** The proposed technological university is committed to providing opportunities for students to access programmes across the full spectrum identified by Quality and Qualifications Ireland (QQI) from levels 6 to 10 (i.e., higher certificate to doctoral studies). These opportunities will be accessible full-time, part-time, and through blended and virtual learning;

2. **A strong focus on higher technical education:** The proposed technological university occupies a unique space within the Irish higher education sector in providing higher technical education with a particular focus on the application of knowledge, research and scholarship;

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and delivery of programmes of education and training, and to ensure that, in so far as possible, innovation activity and research undertaken by the technological university reflects the needs of those Stakeholders.

3. **Student–Staff Relationship**: The Curriculum Model recognises the central relationship between the student and the academic staff member and that this dynamic is critical to promote understanding, intellectual and cognitive development. In this regard there is less emphasis on recall of knowledge and more focus on building critical awareness. It further recognises that the creation, delivery and monitoring of technological university programmes goes beyond a technical exercise and recognises the role of the technological university academic as a professional who uses their judgement in managing the interaction with their students;

4. **Student-centred:** The proposed technological university curricula are developed with a strong student-centred focus. This student-centred ethos provides a personalised approach to the curriculum and facilitates each student in determining to some degree their unique educational programme and related experience. The needs of each student are central to the educational process. Programmes are available in a modular format to facilitate students in self-tailoring their programme content to some degree;

5. **Student Engagement & Connectedness**: is at the heart of the proposed technological university student experience. The concept of student experience is complex. It hinges on the relationship between the student and the technological university. It relates to the quality of the engagement with academic, administrative and support staff as well as their interaction with fellow students, external communities and potential employers. This connectedness is promoted through a range of learning experiences which include:

   a. An emphasis on supporting students make the transition to higher education whether it is from a traditional entry route such as the Central Applications Office (CAO), through progression routes, access and mature student pathways;
   b. Access to a particular 1st year experience which centres on building engagement between each student and the technological university capable of sustaining the student through the early part of their programme. This experience is characterised by *high impact* learning events that build and strengthen relationships;
   c. Proposed technological university programmes will provide *placement* opportunities for each student to facilitate their application and testing of concepts as well as processes and procedures that encourage and promote the development of personal and professional skills;
   d. International student and staff mobility are encouraged across proposed technological university programmes with a view to developing wider international perspectives while developing necessary skills to operate within a global environment. Internationalisation of the curriculum is also a feature of each programme.

6. **Stakeholder Influence**: The Curriculum Model recognises the many stakeholders who have an interest in the proposed technological university curriculum. While recognising that the proposed technological university is located within Dublin City, north-west Dublin, and south-west Dublin, its location at the nexus of tributarial networks means its proximity to Government Departments, State agencies, national and international policy groups and advocates, community groups, city and county councils, representative organisations, alumni, businesses provides a key dimension through:

   a. The use of *Advisory Boards* that draw together key industry partners from major sectors including the arts, community and civic society organisations, science & technology, engineering, services sector, arts & media as well as tourism and business. These Advisory Boards will assist the technological university programme teams identify key areas of interest;
   b. The use of *Campus Engagement* groups which reflect evolving needs of the community groups;
   c. The use of *Professional Bodies* that reflect the needs of particular professions such as engineering, optometry, accountancy, environmental health, food, and social sciences;
   d. The use of technological university governance groups such as Academic Council and its Sub Committees.

7. **Integration & connectivity across core activities:** The Curriculum Model for the proposed technological university draws together, where possible, core institute activities of learning and teaching, research and engagement within the curriculum and in so doing encourages and promotes greater integration and connectivity across these core higher education activities. All students will, through their undergraduate education, be encouraged and facilitated to develop research skills as part of their programme.

8. **Pedagogy:** Within the Curriculum Model there is a strong focus on pedagogy that supports the learning outcomes and graduate attributes being sought. Teaching and Learning is an important component in this process, and while quality teaching can include definitions and concepts that are varied, there is nonetheless a growing number of actions, strategies and policies currently that will be pursued by the technological university aimed at improving quality in teaching. These initiatives include a greater recognition of contextual issues, educational processes, a greater focus on outcomes and recognition of engagement and best practice.

Managing Curriculum Transformation

The proposed technological university promotes an array of academic programmes at levels from 6 to 10. In practical terms this means that appropriately qualified students may enter at any level. In the case of students choosing to pursue their studies using the ladder system moving from one level to another, the proposed technological university will make provision either through attainment of the highest terminal award which may be obtained by

students, or in the case of those deciding to leave their programme of study, they can obtain

an exit award at the level at which they have satisfied successfully examination and

assessment criteria. There is equal flexibility to afford students opportunities to pursue

studies and gain credit through non full-time participation opportunities according to their

needs and requirements. This not only provides tangible evidence of the proposed

technological university's commitment to lifelong learning but also provides alternative

routes for those who do not gain access to higher education programmes through the Central

Applications Office (CAO) process for entry to first year. The proposed technological

university is committed to providing flexible pathways to students who pursue further

education (FETAC) programmes to gain access to higher education programmes.

Aside from what principles and features should best typify a transformed curriculum,

the transition of 612 programmes, constituting its current programme portfolio, offered by the

TU4Dublin alliance presents a significant challenge especially where there are already

variances against the proposed technological university curriculum model. Table 1 presents

an overview of the portfolio of programmes provided by the TU4Dublin alliance.

Table 1. *Distribution of programmes by level among TU4Dublin alliance, full time and part
time, 2015-2016.*

Programme Level	Full-time			Part-time		
	DIT	TA	BL	DIT	TA	BL
6	10	8	3	47	17	10
7	27	23	21	27	21	8
8	103	30	33	25	19	6
9	60	9	6	76	9	2
10	5	6	1	-	-	-

In order to respond to the transformational challenges contained within the proposed

curriculum model, the requirement to journey from the present to a future state in a coherent

and timely manner is a critical dimension for the alliance to realise technological university

designation. To do this successfully requires agreement across the alliance so that the

necessary transformational work can be undertaken in a structured and reflective manner

along the following lines:

1. One over-arching principle is the necessity to ensure that there is no confusion among current or prospective students:
   a. There should be clarity in how programmes are named and described;
   b. There should be clarity in programme levels;
   c. There should be clarity in the accreditation status of programmes;
   d. There should be clarity in access, transfer and progression routes;
   e. There should be clarity regarding the campus locations where programmes are offered.

2. Any variances in graduate attributes among the TU4Dublin Alliance should be reconciled and replaced by a commonly agreed set of graduate attributes.

3. DIT, ITB, and ITT should adopt a common set of questions that enables like-for-like discussions on similar/duplicate programmes. For each programme under review, responses to this set of guiding questions should be completed.

4. Each programme is owned by a School. Therefore, responsibility lies with the School to ensure the coherence of its programmes.

5. The same programme may be offered at multiple campus locations. For example, a BSc offered in one campus will be the same programme offered on other campuses. There may be local variations in how a programme is delivered on each campus, for example electives may be different, and the staging may be different, but the core curriculum, learning outcomes, level, etc. will be the same.

6. Appropriate management structures will support common programmes on each campus.

7. All programmes will go through the same validation process. This process can be addressed by the adoption of agreed quality assurance principles and processes pre-designation, if necessary.

8. Students who commence their programme of study on one campus can expect to finish their programme on that campus. There is a further requirement to identify a clear 'grandparent' principle so that there is not an indefinite expectation that students can return to the original institution on which they initiated a programme to continue their studies there. For example, a reasonable termination date might be one additional year beyond the expected on-time completion date for that cohort of students. The grandparent principle will be needed should it become necessary for a School to discontinue a programme on one campus.

9. There is agreement on one named programme award to avoid confusion among prospective students. As an example, there can be only one Bachelor of Engineering (BE) in Mechanical Engineering. Local variation within a named award can be

accommodated at elective level, although there must be agreement on the composition of core modules.

10. Each campus location can offer programmes from Level 6 to Level 10, i.e., campus locations are not differentiated by restrictions on the QQI level of programmes offered.

Suggested Guidelines to Facilitate Disciplinary Discussion Between Programme Boards

In addition, there will be a requirement to structure dialogue between programme boards in order to identify common features-by-programme to permit comparable benchmarking before work to transform programme and curriculum can occur in any meaningful manner. To do this successfully requires agreement across TU4Dublin, within the partners currently and among the partners in the pre-designation phase, so that the necessary transformational work can be undertaken in a structured and reflective manner using the following questions as guidelines listed below:

Enrolment and Progression	Programme characteristics
Are there special entry requirements?	What % of the programme involves non class activity, e.g., thesis/dissertation/portfolio work?
What is the annual enrolment onto the programme?	What is the class size per year?
	For lectures: For Labs & Workshops:
What is the progression rate per annum?	Is this programme combined with other(s), and how?
Are exit awards available? Are Minor awards available?	Are language subjects available as core/elective/options?
What are the transfer options from the programme?	Is study abroad a feature of the programme?
Are there transfer options into the programme?	Is work placement an integral/optional component of the programme?
How does the programme/discipline address the strategic needs of the region in which the programme is currently offered?	Can students currently study/take "floating electives"/interdisciplinary electives on the programme for credit towards their overall award?
What do you need to do with existing programmes in order to respond to strategic opportunities in your region?	

Teaching, Learning and Assessment	Resources
What are the programme innovations in first year, e.g. mentoring?	What is the financial running costs associated with this programme per year?
How does the programme assess students?	What are the staff requirements needed to run the programme?
Does reflective learning and journal keeping feature on the programme? If so, how?	**Other**
What is the current and proposed use of VLE and/or technology on the programme?	What is the relationship between the programme and the TU Graduate Attributes (including such guiding principles as programme entrepreneurship and engagement)? What are the staff training requirements associated with any new or re-design initiatives?
Graduate Profile	What considerations ought the Programme Board make to align the programme within a TU4Dublin Curriculum Model?
What is the % of 1, 2.1, 2.2, on the programme?	How is volunteering and engagement accommodated within the programme?
What are the postgraduate programmes that graduates from this programme have pursued upon graduation? What are the employability statistics associated with graduates of the programme?	

Conclusion: Opportunities and New Horizons

Since the publication in 2005 of the European Commission's 'Mobilising the Brainpower of Europe: Enabling Universities to make their full contribution to the Lisbon Strategy', the subsequent publication in 2009 of the ENQA report on *Standards and Guidelines for Quality Assurance in the European Higher Education Area European*, followed by the *National Strategy for Higher Education to 2030* (2011) three challenges are evident for the sustained evolution of higher education curriculum development and transformation. The three challenges are not only relevant in a Europe-wide context but also directly impinge on the curriculum transformation challenge faced by TU4Dublin in its journey to become Ireland's first technological university.

These three challenges can be cast and particularised to TU4Dublin in the following manner. First, there is a requirement as a technological university to achieve world class quality; second, there is a requirement to improve governance structures that preserve public

confidence and situate the technological university to respond to societal change; and third, the need to increase and diversify funding for higher education. To realise this third requirement successfully means that the technological university curriculum has to rebut the presumption that it is the same as any other state-funded higher education institution.

To transform successfully its programme and curriculum, TU4Dublin will be required to present evidence that its do not represent a plethora of sameness in terms of mono-disciplinary programmes and teaching and learning methods that are based on a perceived norm of teaching to the best and brightest learners.

In adopting the proposed guiding principles presented above to structure the transformational process by eliminating duplication in a structured manner and through the adoption of a curriculum model that is fit-for-purpose, the TU4Dublin portfolio of programmes will be capable of explaining "at home and abroad the specific value of what… [it produces]… for learners and society" (EC, 2005, p. 4).

The guidelines presented above through which each programme can be fairly scrutinised are important because they are transparent and verifiable as they are based on fact and not presumption nor assumption! If this process is to succeed then a likely timeline within which programme transformation can reasonably be expected to be complete is ten years, or two cycles of programmatic review. Aside from efficiencies that may be generated initially and the opportunity this presents for staff and learners to engage in new modes of teaching and learning and research, significant other opportunities will become evident to support deliverables associated with curriculum transformation in terms of enhancing the learner experience inside and outside the classroom and laboratory. Two further propositions underlie challenges associated with curriculum and programme transformation and require positive responses as signifiers of success.

First, if the technological university is to be different from other HEIs citing as its premise that excellence is never permanent then a new array of thematic factors will be required for the process of perpetual transformation. These factors include flexibility, 'customised learning paths' and innovation in the area of teaching and learning, as well as broadening access both to those who conform and those who do not conform to standard and non-standard models of engagement and learning in university education (EC, 2005, p. 5).

Second, if curriculum renewal is characterised as a cyclical process of revision so as to maintain relevance to changes in society, then the transformed curriculum of necessity must encompass such transversal skills as engagement, research, entrepreneurship, ICT, and team working skills. Subtly, the horizon presented by the technological university must further offer a portfolio of programmes that represents a public good capable of 'breaking the link between social origin and educational attainment' (EC, 2005, p. 6).

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