Interdisciplinary Ways of Thinking and Practicing . . . . . Without Tears

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University of Central Florida
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• The storm signals are there:
  – questions about the disciplinary context in which higher education is delivered
  – the need for research-based responses to the grand challenges facing society
  – the employability beyond academia of the PhD graduate
The doctoral researcher needs to:

– to explore and exploit the value latent in the thesis research
– to recognize the corresponding need to interact with others
– so that, together, they might progress from disciplinary expertise through multi-disciplinary interaction to interdisciplinary outcomes

Doctoral education is challenged to develop within the researchers new and different skills and perspectives.

Combined, the elements of this response define doctorateness as a new threshold concept.
Our Objective Was...

… to explore how distinctive learning spaces can be built into doctoral teaching-learning environments (TLEs) in order to create opportunities for cross-disciplinary transformative learning to occur.
How Could We Create Doctoral Learning Spaces That. . .

Enabled students to:-

– think beyond their own discipline
– communicate across traditional disciplinary divides
– in order to exploit the potential in their thesis research while not diluting the disciplinary core of the research.

Graham Cagney, 2013
Established Components of Doctorateness

<table>
<thead>
<tr>
<th>Contribution to Knowledge</th>
<th>Stated Gap in Knowledge</th>
<th>Explicit Research Question</th>
<th>Conceptual Framework</th>
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<tbody>
<tr>
<td>Conceptual Conclusions</td>
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<td>Explicit Research Design</td>
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<td>Research Questions Answered</td>
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<td>Appropriate Methodology</td>
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<td>Conceptual Argument Throughout</td>
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<td>Clear / Precise Presentation</td>
<td>‘Correct’ Data Collection</td>
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*Figure 1: Components of Doctorateness, Trafford & Leshem (2009:5). Adapted by Graham Cagney & Coughlan, 2012*

- Demonstrating ‘doctorateness’ comes from integrating:
  - **high levels of competence in research**
  - **deep discipline knowledge**
  - **competence in presentation of the argument**

Graham Cagney, 2013
Congruence in the ‘Inner’ TLE Leads to Doctorateness

Graham Cagney, 2013

Adapted from Graham Cagney 2011
Conceptual map of the ‘inner’ Innovation Academy Teaching-Learning Environment

- Choice & Organisation of Content
- Teaching Methods
- Assessment & Feedback

PG Certificate Contexts
- Aims & Learning Outcomes
- Course Design & Organisation
- Contact Hours & Workload
- Choice provided for Students

Teaching & Assessing Content
- DUAL Institutional & Disciplinary contexts

Student & Student Cultures
- Orientations, Beliefs, Norms & Values
- Peer Groups, Morale, Identities
- Influences from outside the Academy - demands & support
- Abilities, Knowledge & Skills in Learning
- Learning Histories & Developmental Levels

Staff-Student Relationships
- Affective Quality of Relationships
- Guidance & support for learning
- Sense of Fairness & Moral Order

Innovation Academy teacher’s beliefs, conceptions of teaching, and reflective practice

Adapted from Entwhistle 2003
The PG Certificate in Innovation & Entrepreneurship

Core Modules: Innovation - from idea to value

**Creative Thinking and Innovation (10 ECTS)**
- Developing confidence in creative thinking
- Evolution of innovative ideas in multidisciplinary teams
- How to translate ideas into value creation

**Opportunity Generation and Recognition (5 ECTS)**
- Identifying what innovation means in the context of my PhD thesis research and my career aspirations
- Identifying critical components for capitalizing on my innovative potential
- Promoting my innovative ideas externally

Multidisciplinary Team Project

Specialised Modules: Capitalizing on innovation (15 ECTS in total)

Graham Cagney, 2013
Innovation Academy TLE

Modules
- Creative Thinking and Innovation
- Opportunity Generation and Recognition
- Planning Your New Venture
- Protecting Your Idea
- Creative Capital

Learning Outcomes
- Creative thinking
- Cross-disciplinary working
- Pitching research to funding bodies
- Handling differences and conflict
- Linking to practise
- Confidence in application
- Advice from industry experts

Teaching-Learning Strategies
- Projects
- Facilitation by staff
- Reflection
- Guest speakers
- Video work
- Brainstorming
- Team work
- Individual work

Graham Cagney, 2013
## Extending the Components of Doctorateness

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### WHEN SYNERGY EXISTS BETWEEN THE COMPONENTS THEN DOCTORATENESS IS DEMONSTRATED

- Demonstrating ‘doctorateness’ comes from integrating:
  - High levels of competence in research
  - Deep discipline knowledge
  - Competence in *linkage, application*, presentation of the argument

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Graham Cagney, 2013

Figure 1: Components of Doctorateness, Trafford & Leshem (2009:5). Adapted by Graham Cagney &oughlan, 2012
Finding the safe harbour for an ‘extended’ Doctoral Learning Space

Two key criteria:-

- Develop the **capabilities** of thinking and practicing in intra, multi and cross-disciplinary ways
- Creating opportunities for **interactions** to occur within the doctoral learning space at inter, multi and cross-disciplinary levels.

‘Extended’ doctorateness is the new challenge for higher education providers

Graham Cagney, 2013
Catching the Wave . . . . .

Interaction

Inter-disciplinary

Multi-disciplinary

Intra-disciplinary

Intra-disciplinary

Multi-disciplinary

Inter-disciplinary

Extended Doctorateness

Traditional Doctorateness

Capabilities

Graham Cagney, 2013
‘Thinking and Talking’ - Toward a Different Perception of Doctorateness

INTRAdisciplinary

Thinking within a discipline
Talking within a discipline

MULTIdisciplinary

Thinking across disciplines
Talking across disciplines

INTERdisciplinary

Thinking between disciplines
Talking between disciplines

adapted from Coughlan & Graham, 2009

Graham Cagney, 2013
Thinking & Talking Across the Disciplines – the RDLE Effect

[Graham Cagney, Quinn & Mannix, 2013]
How Could We Create R&D Working and Learning Environments That …

Enable graduates and post-graduates to:

• think beyond their own discipline
• communicate across professional disciplinary divides
• enhance the commercialisation of applied research
The ‘inner’ RDLE effect

**RDLE**

<table>
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<tr>
<th>Enablers</th>
<th>Core processes</th>
<th>Outcomes</th>
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<tbody>
<tr>
<td>WIT/TSSG Systems &amp; Procedures</td>
<td>'Inner' R&amp;D Learning Environment</td>
<td>'insider inquiry'</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>Project Delivery &amp; Assessment</td>
<td>Opportunities for Learning</td>
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<tr>
<td>Clients</td>
<td>Staff/Client Relationships</td>
<td></td>
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<tr>
<td>Researchers</td>
<td>Project Contexts</td>
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Source: Adapted from Graham Cagney 2011

Graham Cagney, 2013
Conceptual map of the 'inner' RDLE (R&D learning environment)

- **TSSG Staff Beliefs, Conceptions of R&D and Commercialisation**
  - Choice & Organisation of Project
  - Project Methods
  - Project Assessment & Feedback

- **Project Delivery & Assessment**
  - Specific institutional & disciplinary contexts

- **Staff-Client Relationships**
  - Affective Quality of Relationships
  - Guidance & Support for Learning
  - Sense of Fairness & Moral Order

- **Researcher & Research Cultures**
  - Abilities, Knowledge & Skills in R&D
  - R&D Histories & Developmental Levels
  - Influences from Outside the Researcher Organisation - Demands & Support
  - Orientations, Beliefs, Norms & Values
  - Peer Groups, Morale, Identities

- **Project Contexts**
  - Project Design & Organisation
  - Contact Hours & Workload
  - Choice provided for Clients
  - Aims & Learning Outcomes

Source: Adapted from Entwhistle 2003
Graham Cagney, 2013
Thinking, Talking & Working
Across the Disciplines – the RDLE effect

Incentive: Motivation, Emotion & Volition

Content: Abilities, Insight & Understanding

Interaction: Action, Communication & Cooperation

Illeris (1999)

Conceptual map of the "inner" R&D-learning environment of the TSSG.

(Adapted from Entwistle 2003)

Source: adapted from Graham Cagney 2011
Research Papers – related to this research stream

• Doctoral Education at the 'Eye' of the Perfect Storm . . .
  • Dr Anne Graham Cagney, TCD.
  • Dr Paul Coughlan, TCD
  
  http://www.innovationacademy.ie/who-we-are/

• Thinking and Talking Across The Disciplines – the RDLE effect
  • Dr Kevin Quinn, WIT.
  • Dr Anne Graham Cagney, WIT
  
  http://www.tssg.org/2012/05/colloquiumattssg/

• Flying the Plane While Building It
  • Dr Anne Graham Cagney, Research Fellow, TCD.
  • Dr Valerie Mannix, WIT
  
  http://www.wit.ie/schools/education/welcome
LIMITATIONS

Until you spread your wings,
you’ll have no idea how far you can walk.