A Plan for using Phenomenography to Explore Academic Conceptions of their Role in Developing Professional Skills in Engineering Students

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CREATE Seminar

A plan for using phenomenography to explore academic conceptions of their role in developing professional skills in engineering students

Una Beagon
25th May 2017
Outline

Context to PhD Study
Lit Review
Research Methodology
Phenomenography
Approaches to Teaching Inventory
Feedback
Teaching Professional skills in Engineering Programmes: The Academic Perspective

A plan for using phenomenography to explore academic conceptions of their role in developing professional skills in engineering students
Context – Industry background

Technical skills are not enough....professional skills get you promoted!
Context – Lecturer in DIT
The ideal engineering graduate

Professional Skills
Critical thinker
Team player
Good communicator
Self directed learning
Negotiation skills
Leadership

Technical Skills
Influences on curriculum design

- Engineers Ireland
- Programme Reviews (QA)
- HEA compact
- DIT strategy

Industry views

Engineering Academics
Research Questions

• What are the qualitatively different ways that academics experience and conceptualise teaching in engineering programmes in Ireland?

• What is meant by professional skills in engineering?

• What are engineering academics’ Approaches to Teaching (ATI Survey Instrument)?

• What is the relationship (if any) between Approaches to Teaching and academics’ background in academia, industry or both?
Literature Review

Professional Skills

- History of Engineering Education
- Grand Challenges
- Approaches to Teaching Inventory
- Industry views
- Academic Training
Research Design and Methodology

**Literature Review**

**Phase 1: Online Survey**
Purpose: To gather general information, provide data for triangulation and to provide purposeful sample for Phase 2 interviews.

**Phase 2: In-depth phenomenographic interviews (10-20)**
Purpose: To collect the varied ways in which academics’ experience or perceive the teaching of professional skills

Phenomenographic analysis of interviews to produce outcome spaces to inform a framework of variation in academic experiences

Framework
Phenomenography

First proposed by Marton (1981)

“Phenomenography is a research method adapted for mapping the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and phenomena in, the world around them” (Marton, 1986, p.31)

Examples:

• Surface and deep learning (Marton & Säljö, 1976)
• Approaches to Teaching Inventory (Trigwell et al, 2005)
• Academics Conceptions of Lecturing (Daniel, 2015)
Bananas

What do you conceptualise to be a ripe banana?

- **Biochemist**
  Colour, softness, smell, no of black dots, pH value

- **Connoisseur**
  Banana ripeness is a function of colour, softness, smell and black dots

- **Colour vision**
  Banana ripeness is a function of colour and black dots

- **Colour Blind**
  Banana ripeness is a function of softness

Expanding awareness of banana experience
Learning

“Learning in terms of changes in or widening of our ways of seeing the world can be understood in terms of discernment, simultaneity and variation” (Bowden and Marton, 1998).

Variation of views ➔ Variation in people ➔ Phase 1 Survey
Phase 1 Survey
Academics teaching on engineering programmes in Ireland

• Gender and Age
• Qualifications (academic & professional)
• Background Career (engineer or other)
• Industrial Experience
• Academic Experience
• EI Accreditation
• Ranking of skills required to make a good graduate
• Approaches to Teaching Inventory
Phase 1 Survey
Approaches to Teaching Inventory
(Trigwell & Prosser, 2004)
Exercise

• Variation in approaches to teaching
• Context specific
• Teaching approaches v’s student outcomes

<table>
<thead>
<tr>
<th>Table II. Intention and Strategy Components for Five Approaches to Teaching (A–E)</th>
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<tbody>
<tr>
<td>Intention</td>
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<td>Information transmission</td>
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<td>Conceptual development</td>
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<td>Conceptual change</td>
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Phase 2
Phenomenographic Interviews
(15-20)

Methodology & analysis
Trigwell (2000) A phenomenographic interview on phenomenography
Walsh (2000) Phenomenographic analysis of interview transcripts
Next steps - 2017/18

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Conference paper
- SEFI 2017: Conference Paper on Research Design for critique

Journal Paper
- Professional Skills in Engineering Students – Top 10
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Teaching Professional Skills in Engineering Programmes: The Academic Perspective

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