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Teaching Professional Skills in Engineering Programmes: The Academic Perspective

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CREATE Seminar



Teaching Professional Skills in Engineering Programmes: The Academic Perspective

Una Beagon

25th May 2017



Outline



Context to PhD Study

Lit Review

Research Methodology

Phenomenography

Approaches to Teaching Inventory

Feedback



Working Title:



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

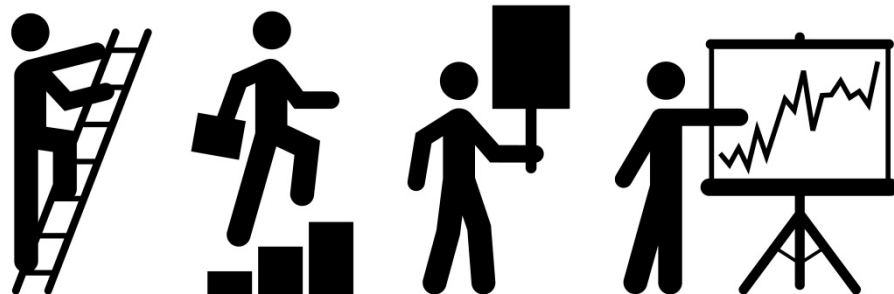
Team player

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

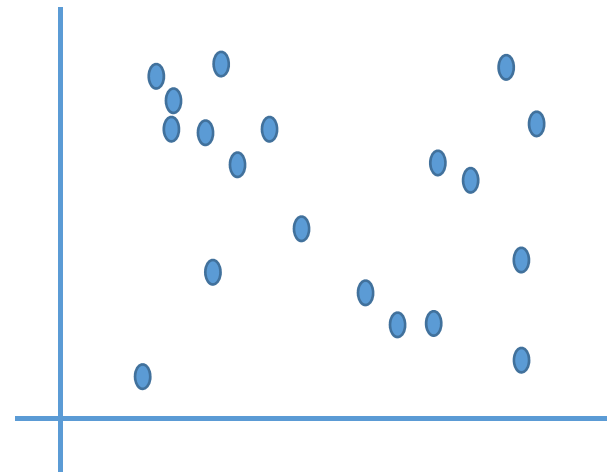
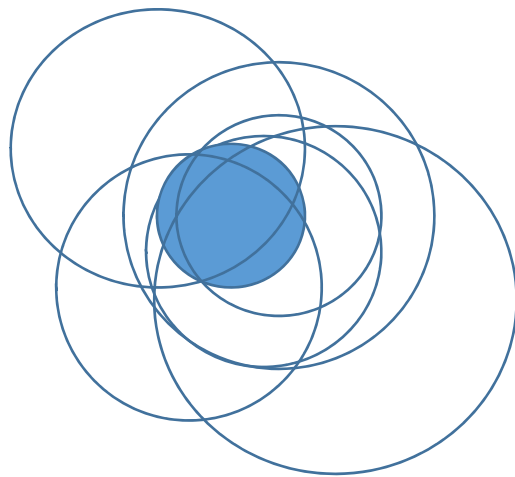


Phenomenography

Phenomenology

v's

Phenomenography



Similarities

v's

Differences



Phenomenography

First proposed by Marton (1981)



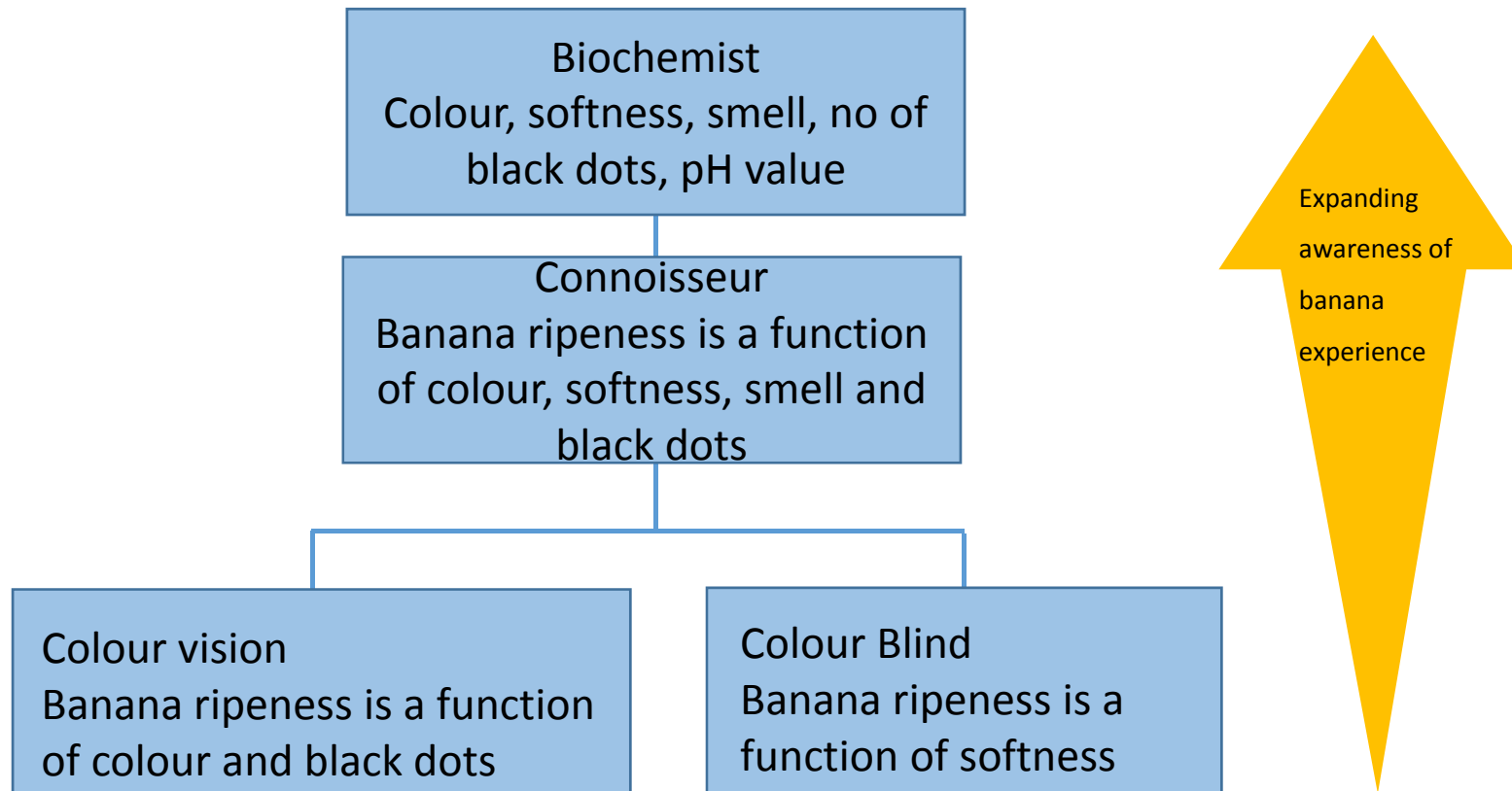
“Phenomenography is a research method adapted for mapping the qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and phenomena in, the world around them” (Marton, 1986, p.31)

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?





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 II. Intention and Strategy Components for Five Approaches to Teaching (A–E)

Intention	Strategy		
	Teacher-focused	Student–teacher interaction	Student-focused
Information transmission	A		
Concept acquisition	B	C	
Conceptual development			D
Conceptual change			E



Phase 2

Phenomenographic Interviews

(15-20)

Methodology & analysis

Trigwell (2000) A phenomenographic interview on phenomenography

Walsh (2000) Phenomenographic analysis of interview transcripts

Ashworth & Lucas (2000) Achieving empathy and engagement: a practical approach to the design, conduct and reporting of phenomenographic research.



Next steps - 2017/18



	2017							2018					
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Lit Review	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Research Design	Blue	Blue	Blue	Blue	Blue	Blue							
Ethics Approval	Green												
Trial Survey		Brown	Brown										
Stage 1 – Survey				Blue	Blue	Blue							
Trial Interviews							Grey						
Stage 2 – Start								Orange	Orange	Orange	Orange	Orange	Orange

Conference paper

- SEFI 2017: Conference Paper on Research Design for critique

Journal Paper

- Professional Skills in Engineering Students – Top 10



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