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Teaching Professional Skills in Engineering Programmes: The Academic Perspective

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

Background

My interest in preparing engineering students for a successful career in industry stems from personal experience of recruiting, mentoring and managing graduates in civil and structural engineering consultancies. The range of skills, abilities and values of each graduate was varied, and it became apparent that academic achievement, whilst important, was not the defining skill for achieving early responsibility or promotion within the company. More often, the graduate who could communicate well and self-direct his/her work was given more responsibility and opportunity.

The intent in this paper is to present a plan for a PhD research study in order to elicit critique and advice in the design of the study, including the research questions and the methods proposed.

Research Questions

The research questions centre around the experience of the academic in the classroom, although we are also interested in factors which may have influenced how the academic contemplates the relative importance of professional skills and their conceptions of teaching and learning in general.

This work will include the use of the Approaches to Teaching Inventory (ATI) (Trigwell & Prosser, 1996).

The authors' background has influenced their own views on professional skills and so we want to investigate if academics with an industrial background have different views to those who have a purely academic background. As a result, this research study has three interlocking aspects as shown in Fig. 1.

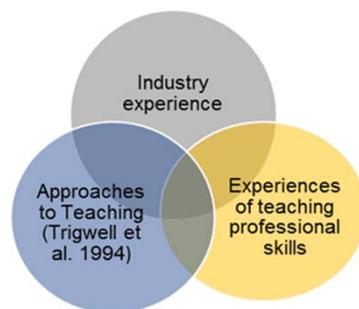


Fig. 1. Interlocking aspects of research study

The overarching research question is;
What are the qualitatively different ways that academics experience and conceptualise teaching and the development of professional skills in engineering programmes in Ireland?

Sub-questions

Sub-questions focusing on professional skills include;

- What are the qualitatively different ways that academics perceive what is meant by professional skills in engineering?
- How do academics manifest their conceptions of teaching through their actions in teaching professional skills?
- What is the relationship (if any) between conceptions of teaching and academics' background in academia, industry or both?
- What is the relationship (if any) between conceptions of teaching and experiences of teaching professional skills?
- What is the correlation (if any) between conceptions of teaching professional skills and academic's backgrounds in academia, industry or both?

Research Design

Phase 1: Online Survey



Academics teaching on engineering programmes in Ireland

Purpose: To gather general information, provide data for triangulation and to provide a purposeful sample for Phase 2 interviews.

The survey aims to collect information in the following categories:

- Gender, professional qualifications, background career (engineer or other), extent of industrial and academic experience, accreditation experience and ranking of important professional skills.

Phase 2: Phenomenographic interviews (20)



Purpose: To collect the varied ways in which academics conceptualise and experience the teaching of professional skills.

Phase 3: Phenomenographic Analysis



Purpose: To create outcome spaces to describe the varied ways in which academics conceptualise and experience the teaching of professional skills in engineering programmes in Ireland.

Research Purpose

To increase awareness of the effect of previous experiences on how academics conceptualise the importance of professional skills and to create a framework to assist academics to reflect upon their own conceptions.

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