

Chapter 79

Engaging Software Engineering Students with Employability Skills

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ABSTRACT

This chapter explores the findings from an Action Research project that addressed the Professional Capability Framework (Scott & Wilson, 2002), and how aspects of this were embedded in an undergraduate Engineering (Software) degree. Longitudinal data identified the challenges both staff and students engaged with. The interventions that were developed to address these are described and discussed. The results of the project show that making soft skills attainment explicit as part of the learning objectives went a long way in assisting students to engage with the activities that exercised these skills.

INTRODUCTION

A number of recent studies have discussed the challenges facing 21st century graduates (e.g. Andrews & Higson, 2008; P. Brown & Hesketh, 2004; Cassidy, 2006). The fast pace of change, affecting the whole of society, has led to a knowledge-driven economy that asks its workforce to “flexibly adapt to a job market that places increasing expectation and demands on them” (Tomlinson, 2012). Being an employable graduate is no longer an automatic result of successful completion of formal study – tacitly acknowledged in the focus on identifying and developing graduate attributes in universities globally as a response to employer concerns.

However, an example definition of graduate attributes: “the qualities, skills and understandings that a university community expects its students to develop during their time at the institution and consequently, shape the contribution they are able to make to their profession and as a citizen” (Bowden, Hart, King, Trigwell, & Watts, 2000) indicates that, although highlighting the required cognition and character development of students, graduate attributes do not have the focus expected by employers on *employability skills*. These have been identified as key transferable soft skills and competencies integral to graduate professional practice (Andrews & Higson, 2008). Employability skills are not job specific and “cut horizontally

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across all industries and vertically across all jobs from entry level to chief executive officer” (Sherer & Eadie, 1987).

As a result of trends in the sector, the nature of ICT employment has evolved and employability has become a major issue (Scholarios, van der Schoot, & van der Heijden, 2004). In the Australian context, a comprehensive study of employability skills conducted on behalf of the federal Department of Education highlighted the importance of abilities sought by employers in addition to technical knowledge and skills (ACCI, 2002). Studies undertaken since 2000 confirm earlier work (Doke & Williams, 1999; Lee, 1999; Snoke & Underwood, 1999; Turley, 1991) that, although the technical competency of ICT graduates can, in general, be assumed, other, softer, skills are considered by practitioners as lacking. In particular the demand and expectation of industry employing ICT graduates has changed: surveys show that they are dissatisfied with graduates in a number of areas (Hagan, 2004).

However, embedding soft skills into undergraduate programmes is not an easy task:

- From the academic’s perspective, this is a tacit aspect of competency and therefore less easy to define and assess – for example, what soft skills should be included? Anecdotal evidence also suggests many academics with high technical expertise find themselves less comfortable in this space, and therefore show a preference for students taking an externally offered course (and therefore without discipline context (Smith, Belanger, Lewis, & Honaker, 2007)) rather than attempting to incorporate these within the discipline
- From the student perspective, technical skills have been viewed as the prime competency to be attained from their studies. Affective skills, cognitive skills, understanding of the ‘context’ in which the task

being addressed, are undervalued, often until well after graduation (Lethbridge, 2000).

This chapter explores the findings from an Action Research project that identified one framework where soft skills appropriate to an engineering context were explicitly described - the *Professional Capability Framework* (Scott & Wilson, 2002) - and how aspects of this were embedded in an undergraduate Engineering (Software) degree. The interventions that were developed to address these are described and discussed. The results of the project showed that making soft skills attainment explicit as part of the learning objectives went a long way in assisting students to engage with the activities that exercised these skills. In effect, soft skills can be mastered in a learning environment that applies active and collaborative learning, acknowledges differences in learning styles, and contextualises the learning of engineering as a profession.

BACKGROUND

Employability

The concept of employability has emerged as a dominant issue in a number of contexts over the last decade (McQuaid & Lindsay, 2005). The quality of the graduate labour market, and graduate ability to meet employer needs, have been the focus of debate across many disciplines acknowledged as impacting on a knowledge-based society. Despite a focus on generic attributes, university graduates lack the ability to apply these in the work place (Precision_Consultancy, 2007). As a result, there is a widespread perception that employability skills are not effectively developed in an undergraduate programme.

Andrews and Higson (2008) indicate that serious concerns have been expressed about an

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