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Citation:

Duncan, A (2011) Soft skills for scientists: not a soft option. *Assessment, Teaching & Learning Journal*, 11. pp. 10-13. ISSN 1756-8781

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Soft skills for scientists: not a soft option

Using self-evaluation,
critical reflection
and peer dialogue to
support professional
and transferable skills
development

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The engineering and technology sectors have long recognised the importance of softer skills for successful career progression, as indicated in job vacancy specifications and in professional competency standards, for example those of the Engineering Council UK (2010) and the British Computer Society (2009). The recent Royal Academy of Engineering report (Royal Academy of Engineering, 2010) draws upon findings from the CBI *Future Fit* report (CBI/UUK, 2009) on graduate employability: “the overall importance of generic employability (or ‘soft’) skills is widely reported ... these attributes include self-management, team-working, business and customer awareness, problem-solving, communication and literacy.” Only 14% of employers surveyed consider graduates to possess the necessary level of self-management skills. Also cited are employers’ views as reported by the CIHE (CIHE, 2008): “86% of employers consider good communication skills and team-working to be important, and many are not satisfied that graduates can express themselves effectively.”

Personal and professional development planning (PDP) processes support employability by encouraging student self-awareness and the articulation of skills to prospective employers. However, implementing effective PDP practice is influenced by the value placed on the processes by staff, and the relevance perceived by students, as summarised by Ward et al in *Personal Development Planning and Employability* (2009). The approach demonstrated by many of the case studies here shows that embedding processes within the discipline helps students understand the benefits of PDP more clearly; this is also recommended by the Higher

Education Academy Engineering and Information Sciences Subject Centres.

At the University of Northampton the experience of facilitating PDP similarly indicates that discipline-specific resources, ideally linked to curricula, help to combat initial reluctance by staff and lack of participation by students. In some disciplines, including Engineering and Computing, time and support provided for reflection and self-analysis had been minimal. Yet feedback from two cohorts from both courses (2008–10) showed that most students readily acknowledge their need to gain a clearer understanding of personal strengths and qualities, and to present themselves more effectively to others. Engineering and Computing staff also identified a gap in students’ ability to connect work-based with academic learning.

Following similar projects with awards from three other Higher Education Academy Subject Centres, in 2008 mini-project funding was secured from the Engineering Subject Centre to produce online PDP resources. The activities include skills evidencing, critical incidents, and peer feedback on self-presentation, helping students appreciate how to improve their chances of success in their studies and in the transition to their careers. Learning that develops employability skills needs to be made explicit, with prompts to explore how these transfer to new contexts, thus increasing students’ ability to manage their career progression. Increased motivation and confidence in the value of HE and where it is leading contribute to student engagement and retention, which in turn impact on the institution, industry and society.

During 2009–10 the materials produced for Engineering were adapted and extended for Computing students, and overall these resources have now been used with over 200 students. As for previous projects the aims were to produce materials to:

- support integration of PDP with curricula
- maximise opportunities to develop transferable skills
- promote links between academic study and workplace practices
- enhance employability through greater self-awareness, articulation of evidence, and self-marketing skills
- increase motivation for review, reflection and planning, in order to become effective professionals.

The materials are available at: <http://pdp.northampton.ac.uk/subjspecindex.html>.

Methodology

Level 4 and 5 Computing students were surveyed about their perceptions of the skills needed by professionals in computing, their understanding of the benefits of PDP, and areas where they would value support. Findings showed distinct similarities with surveys of two cohorts of Engineering students, highlighting some interesting attitudes to the relative importance of 'softer' skills and understanding of PDP:

- low priority was given to the importance of some softer skills, oral and written communication and commercial awareness all receiving low scores by both year groups
- team-working and interpersonal skills also scored lower ratings than technical and problem-solving skills.

In terms of students' understanding of PDP, it was the more functional rather than insightful aspects that were cited most frequently:

- identifying skills, recording achievements and planning next steps were mentioned most often
- reflecting on links between study and work was seen as less significant.

In terms of areas where support would be welcomed:

- help in becoming more aware of strengths and weaknesses was highlighted by a majority (70%)

- help with gathering convincing evidence and presenting themselves more effectively to others in CVs and applications was cited by 69%.

Data from Engineering students revealed similar priorities, with "becoming more aware of strengths and weaknesses" uppermost.

This provided a focus for the development of specific PDP tasks which would meet these needs. A selection of tasks was trialled in workshops for Computing students in Levels 5–7, with an emphasis on prompts to individual thinking and self-questioning, paired conversations, and sharing insights with the group. Such dialogic reflection had been shown previously to give new perspectives on wider learning experiences, and to clarify strengths and the transferability of skills, resulting in greater self-awareness and self-confidence. Using critical incidents from employment to analyse attitudes and behaviours showed participants the benefits of reflective professional practice, and recording thoughts in writing helped them articulate their self-development. An emphasis was placed on the value of personal storytelling in demonstrating relevant evidence of skills applied in real situations: initial surveys had shown a wide spectrum of appreciation of how this helps individuals impress in selection processes.

Workshop activities

Level 5:

- subject-specific skills audit linking academic skills to the workplace; reflective prompts on insights gained from work roles; critical incidents
- storytelling to evidence skills; job skills analysis; research into graduate roles; employability action plan.

Levels 6 and 7:

- project-planning tools linked to dissertation management; critical reflection tasks; building evidence for self-presentation strategies.

For Level 5, the academic tutor facilitated complementary employability activities, including visits from alumni sharing their postgraduate career paths. Video clips of these graduates will be added to the online material, together with an employers' perspective. These will cover career pathways, rewards and challenges, progression opportunities and advice to current students. The material also includes relevant careers resources, links to professional associations and options for further study, allowing students to broaden their aspirations and explore alternatives.

These could also support curriculum-based projects, context cases or research tasks.

All the activities can be downloaded or saved into e-portfolios: written materials are practical and encourage brief but regular reflective logs. Potentially materials will facilitate PDP processes for students on programmes in Computing across the sector, enabling staff to support PDP through seminar workshops and tutorials.

Outcomes and evaluation

Students at all levels participated actively in the sessions, and a majority followed up further employability activities for Level 5. Formal evaluation will be carried out as these Computing students move into Level 6, but informal feedback suggests they have been assisted in clarifying how to manage their personal progression effectively. Positive evaluation was received from 12 (100%) Level 7 students on the benefits of the tasks for understanding and building on personal strengths, articulating relevant evidence clearly, and presenting themselves as individuals in selection processes. These outcomes reflected similar feedback from the Engineering workshops delivered over the last 18 months, and the embedding of similar activities across disciplines in the Arts and Humanities using the relevant resources.

Reflections

Establishing committed support for personal and professional development in HE departments can typically be a long and tortuous process, not least because of misconceptions of what this involves, but also owing to a sense of it being an added burden for both students and staff. An acceptable starting point might be a more explicit articulation of what is already being delivered, and structured time provided for students to practise these skills, especially those frequently perceived as less important.

The availability of meaningful discipline-specific resources linked to the demands of professional practice can help substantially to overcome these hurdles and encourage more enthusiastic engagement, especially when the processes involved are seen to support specific assessment activities, such as a presentation or final-year project. A key outcome of this provision therefore might be a lever for increased ownership of PDP by staff and for a willingness to embrace softer skills development for students of science and technology. In addition provision of such resources has been shown to generate interest from other teams as they evaluate their own support structures.

Current research into effective PDP practice by the National Action Research Network (Centre for Recording Achievement, n.d.), and the Quality Assurance Agency (QAA) guidelines on PDP (Quality Assurance Agency, 2009), emphasise the benefits of embedding activities within curricula and the significance of the process being valued by programme teams. Reflective practice as valued in the workplace is a high level skill which needs time to develop before it becomes habitual: the contribution HE can make to developing this is emphasised in the *Future Fit* report (CBI/UUK, 2009). The strong links with employability and professional practice are key motivators for students, and it is hoped that using discipline-specific materials will help them make those essential connections between past, present, and future learning in different contexts.

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