

Employability Strategies for Progression



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Introduction

Opportunities to acquire the skills, which are relevant for a smooth transition from HE to industry, should be included within the curriculum of all vocational degree courses. These skills should include those relevant to working in a competitive engineering environment. The awareness of this by students could benefit application to academic studies and retention rates.

Yorke and Knight (1) have proposed a model and carried out an audit which has identified common curriculum impediments to good learning, has identified a list of principles of good teaching for developing employability under headings: personal qualities, core skills, process skills, and has identified weaknesses.

Reference

(1). Employability through the curriculum, Yorke M, Liverpool John Moores University and Knight P, The Open University, Skills Plus: Tuning the Undergraduate Curriculum, June 2002



Employability Case Study: Product Enterprise: preparation for employment

Designers of electronic engineering degree curricula have for many years been aware of the need to give undergraduates the skills necessary to work in a competitive engineering environment. The Enterprise in HE initiative has addressed some of the shortcomings in recent years, but there is a need for further skills relating to producing successful products. Chandler (1) describes the mismatch between the skills and expectations of new graduates and those of employees and has proposed a teaching module for final year. The inclusion of this type of material in the curriculum could contribute significantly to recruitment and retention of students.

At the University of Huddersfield, a module entitled Product Enterprise was first introduced into Year 2 of accredited courses in electronic engineering in the early eighties, modelled on the scheme at the University of Bath. This was encouraged by the, then recently new, Head of Department at Huddersfield. Its content is similar to the proposal of Chandler (1). The

emphasis has always been on striving to achieve a successful product and in providing experience of group activities.

In the early years of operation this was very successful: it was popular with most students and staff, with interesting products and good cooperation from industry. IEE accreditation panels have been very complimentary.

Over the years, it became less popular with students, due to a shortage of new interesting products and working in larger groups, resulting in poor participation by some students.

A skills shortage in some students at Year 2 resulted in the present arrangement of extending the Enterprise exercise into Year 4 (the majority of students are thick-sandwich). Students then have more technical experience and have some experience of working in industry. It has been essential to programme this carefully with the final-year individual project module, eg final presentations must be before individual project reports and vivas are due.

Major EA2 components of the electronics pathways at the University of



Huddersfield are experienced in the modules: Enterprise at Year 2 and the Enterprise Group Project at Year 4.

These provides students, working in groups, with realistic experience of using various personal skills, as well as integrating other pathway-specific engineering features.

The aim is for each student to experience the development cycle of a new electronic-based product from inception to production, with emphasis on quality throughout. Various aspects are integrated, from which students will appreciate the need for high quality in every aspect of management, design and production, in order to create commercially viable products. They practice and develop personal management and organisational skills needed for product development in a group environment.

Student groups are allocated a group tutor (timetabled for 1 hour per week) to act in an advisory capacity, but the groups must be student-led. Outline guidance on tasks

involved in each phase will be given but groups must organise themselves to complete them.

A similar scheme operates for software-based degree courses, where a software product is developed which is relevant to a particular pathway, eg BSc Virtual Reality Design

In Year 2, students act as consultants proposing a new product, designing and developing it, preparing manufacturing and marketing arrangements and presenting cash flow predictions and financial implications.

The group work is supported by a lecture programme given by industrialists and University staff, covering aspects of engineering management, design-for-manufacture and manufacturing, and relevant aspects of business, marketing, sales and finance.

Assessment includes written and oral presentations with industrialists involved:



- o individual log books: 10%
- o group report and Review Board (with industrialists): 40%
- o written exam covering Engineering Management, DFM and Manufacturing and Business in entrepreneurial activity: 50%

Phase 1 - Planning

To produce a design specification for the product. To prepare a plan for the design phase of the project. To forecast the cost of work to be done in all phases. To prepare a cash flow forecast and estimates of the product cost. To submit a group report and attend a review-board meeting.

Phase 2 - Design

To produce detailed designs for each sub-system of the product. To determine standards and sources of components and assemblies. To identify and specify any long-lead items, such as production tools, test equipment, or components. To identify, make, and test such models as are necessary to explore the functional, ergonomic, or aesthetic parameters of the design and to prepare drawings/sketches for such models. To prepare an outline test specification and a working design-improving test specification. To update the

costings. To prepare and submit a group report on the work of Phase 2. To attend a review board meeting at which the contents of the report will be discussed.

The Year 4 module is designed as an extension to the Enterprise module in Year 2. It gives the opportunity to fully develop a working elaborated prototype of a technical product, together with consideration of the commercial, marketing, selling, financing and enterprise aspects. The emphasis is on the technical aspects of the project and all students are expected to contribute to this.

Assessment:

- o individual report giving a critical assessment of the group work and of the student's own work: 30%
- o individual Log Book: 20%
- o Group report and Review Board (with industrialists): 50%

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Reference:

(1) The employment of Electrical and Electronic engineers - a practical appreciation from both sides of industry, Harry Chandler. PROGRESS I Conference Proceedings, 2001.



Employability Case Study: Personal and Professional Development & Academic Tutoring

The provision of personal and professional skills is combined with pastoral tutoring at Sheffield Hallam University. The well resourced, timetabled and structured approach to personal and professional development over Years 1 and 2 depicts the emphasis and importance attached to this area, and its contribution to retention of students.

In the early nineties, personal and professional development (PPD) tuition was introduced into an integrated engineering degree course, resulting in an increase in Year 1 retention from 70 to 90 %. This was then applied to all the courses in the School of Engineering, with retention rates of about 90%, for eight years. Unfortunately, some academic staff refused to take part, leaving a nucleus of 4 or 5 to staff it.

For the 2002/03 session it has been replaced by the Academic and Learning Skills Scheme (ALS), which aims to continue the high retention rates but with wider participation by various stu-

dent minority groups. Academic staff across the School are cooperating with this repackaged version of the previous PPD scheme.

Experience of the scheme in the nineties showed that effective PPD provision required a well-defined specification with sufficient flexibility for the provision of relevant material and case studies in a structured sequence. It also relied on academic staff who could empathise with new students.

Weekly 1.5 hour classes are held for each group of about 20 students with a tutor, across the School. The student work is assessed, but no separate credits are awarded - the marks are weighted into the main modules of the Year.

With the full support of the Director of School, the structure has been refined in the new ALS scheme, based on experience. The content during semester 1 has been reduced to be able to have more one-to-one interviews, and to spend time on induction to the new HE environment, eg carefully explaining the strict assessment regulations. It includes course arrangements and regulations, introduction to



professional bodies and University Learning Centre, presentation skills with assessed CV and oral report and academic tutoring in semester 2 the PPD focus is on four key activities:

- o a 'product evaluation' group exercise requiring the production of a poster (or other appropriate form of report)
- o individual interviews to feed back results and outcomes after the assessment boards
- o evaluation of the 'presentation' of a formal lab report done for another technical unit. Mark to be included within the technical unit. The PPD tutor will agree with the class which is the most appropriate laboratory exercise to assess.
- o a quick 'data search' for information on a company that students may be considering approaching for summer vacation work

PPD is continued at Year 2 with preparation for the Supervised Work Placement and with Continued Professional Development. It receives the same high-resourcing emphasis with 1.5 hours timetabled each week with Group Tutors.

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Employability Case Study: Preparation for Work Placement

All engineering students at Sheffield Hallam University are required to have a paid industrial placement in Year 3, and this provision has been very successful for many years. Placement provides students with extra knowledge and skills, which enable them to participate better in their Year 4 studies.

The formal structured preparation, which is provided for the placement, is equally applicable to any future employment as a graduate. It may also have a beneficial influence on the students' approach to Year 2 academic studies, although no statistics are available to correlate placement preparation with academic performance at Year 2.

The well-resourced, timetabled and structured approach to personal and professional development over Years 1 and 2 depicts the emphasis and importance attached to this area, and its contribution to retention of students.

Preparation for work placement is carried out in Year 2, as a continuation of

the personal and professional development of Year 1. As in Year 1, weekly 1.5 hour classes are held for each group of about 20 students with a tutor, across the School. The student work is assessed, but no separate credits are awarded - the marks are weighted into the main modules of the Year.

A placement year attracts half fees to the university, which resources all placement costs, such as liaising with industry to find places, preparation in Year 2, visits in Year 3, debriefing and assessment in Year 4. Students also pay half-year tuition fees to the university, so they expect high-quality support from the university. The university's responsibility includes providing information on health and safety prior to the placement.

Preparation includes:

- o CV preparation
- o covering letters
- o application forms
- o interview preparation and techniques

Standard documents for these tasks, and on other helpful topics, are used across the university. This comprehensive set are available from the Professional Experience Unit of the



School of Computing and Management
Sciences and can be found at
<http://www.shu.ac.uk/schools/cms/peu/>
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Employability Case Study: Progress Files/Personal Development Planning

UK higher education institutions are developing and introducing Progress Files

following a recommendation of the National Inquiry in Higher Education (Dearing Report 1997). All institutions must have Progress Files in place by 2005/6.

Progress Files consist of a transcript of a student's achievement and a Personal Development Plan. Personal Development Planning (PDP) is a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development.

A variety of terms are used in HE to describe a process of reviewing and recording learning and achievement, and action planning e.g. Personal Profiling, Personal and Academic Records, Personal (Academic) Development Plans, Progress Files, Learning Portfolios, Learning Logs and Diaries. Many of these emphasise that

this is an active learning process undertaken by individuals for themselves. The process of PDP can help individuals to record milestones in their work and to reflect upon the most successful ways of achieving results. In a broader sense, reflecting through PDP in a profile can also help with career choices, applications and interviews, future career management and professional development.

PDP is increasingly being used in the world of employment to chart an employee's progress. Promotion and advancement are unlikely to come automatically; an applicant will need to convince an employer that he/she is worthy whether the employer is in a University or elsewhere.

This PDP part of the Profile is an attempt to help individuals amass information to chart progress towards an individual's objectives. It should provide an individual with a record of their achievements and provide a source of evidence.

The PDP process part of the Progress File should help students to:

- o identify strengths and weaknesses as a student/researcher
- o identify training needs to



- o improve performance
- o record reasons for successes and failures
- o set an agenda for talking to tutors
- o set their own objectives
- o monitor their progress
- o review their objectives
- o devise a plan of action, and
- o provide a reference document of achievements

Computerised online facilities are being used or created at various universities. LUSID <http://lusid.liv.ac.uk/> has been developed as an interactive web-based Personal Development Planning (PDP) tool at the University of Liverpool (and is now being used at other universities). It supports recording, planning, reflection, skills auditing, automatic CV construction, skills guidance and a reporting facility, and has been used across the university over the last three years.

LUSID offers support in four main areas: recording and reflection, action planning, auditing skills and reporting. Guidance and support is provided throughout the system to promote independent personal development

planning.

The recording section can be used to collate details of learning experiences including employment information, educational achievements and (work-based) learning logs. All experiences can be analysed in terms of skills used and knowledge gained. The action planning section allows the planning of goals and activities, either by the use of an interactive Gantt Chart, or by importing a predefined plan. An individual's skills can be audited and, based on this, guidance provided to help improve competence. The reporting section can be used to draw together all data stored within LUSID in the form of a CV (or equivalent) which can then be sent via Email to interested parties (and edited in a word processor such as MS Word if so desired).

All pages in LUSID can be customised to include local terminology, resources and guidance. An individual department or tutor group can have its own customised set of pages which, for example, will allow specific exercises to be set, a subset of skills to be audited, or predetermined action plans for course elements to be imported.



Students at the University of Nottingham, and seven partner UK universities, can use the PADSHE system at <http://www.nottingham.ac.uk/padshe> to produce personal and academic records.

The RAPID Progress File system is used at the University of Loughborough: see <http://rapid.lboro.ac.uk/>

Students at the University of Exeter can record their achievement using the PESCA system: see <http://www.ex.ac.uk/~sjtreano/learning-connect/pesca.htm>

The University of Leeds has a scheme of recording and reviewing achievement available to their students: see <http://www.leeds.ac.uk/pdp/>

The Centre for Recording Achievement <http://www.recordingachievement.org/>

was originally established as an Employment Department Project in 1991 to support staff in schools, colleges and higher education who were interested or involved in recording stu-

dent learning and experience and in using the process to support student progression into higher education and the development of practice in participating Higher Education institutions.

It supports good practice and the sharing of experience in Recording Achievement and Personal Development Planning on a national basis, not only in initial education but also in lifelong learning in employment and through professional bodies.

All Year 1 engineering students (approx 100) at the University of Exeter are encouraged to reflect on their learning. At the end of each week during the first term they complete forms with standard questions which require them to reflect on their learning in the week. The forms are read and comments added by a university study-skills counsellor. These are then returned to the students by their personal tutors. This exercise has 5% weighting in the Professional and Skills Development module.

The wastage rate of 34 % three years ago has been reduced to 18% in the last two years, during which time this reflective learning scheme has been in operation along with other changes.



The feedback from students has been complimentary, with many students having continued with the scheme independently after term one.

Academic staff have welcomed the comments from the professional counselor, which students also valued as an essential component of the scheme.

Experience has shown that it is essential to encourage students to participate in the reflective learning scheme as soon as possible in term one. Some students prefer to carry out their own reflective learning scheme.

However, students at Exeter are required to take part in the scheme provided, and then subsequently they can develop the method which suits their own individuality. A careful balance is required between pushing them into a preformatted method and allowing the freedom to develop their own.

Ultimately, they are learning how to take responsibility for their own learning.

The university's computerised system PESCA has not yet been used in engineering. Some form of recording

progress is necessary, but it must have sufficient flexibility for various types of students.

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