

**Gateways Development Fund Project**  
**Flexible Pathways to becoming a Professional Engineer**

**REVIEW OF ACTIVITY 2006 - 2011**

**March 2011**

## Introduction

Engineering Council-led work initiated in 2006 has led to the development of a model for a workbased pathway for working engineers who wish to achieve professional engineer status through their workplace activity. This report is for the period 2006 – 2011, and builds on the Interim Review (March 2010) that included in-depth research, face-to face interviews and surveys of the key stakeholder groups. The report is available at <http://www.engc.org.uk/ecukdocuments/internet/document%20library/Interim%20Review%20of%20Gateways%20Development%20Fund%20Project.pdf>

## Background

In response to recommendations in the ‘Gateways to the Professions’ report<sup>1</sup>, the previous UK Government established a development fund for projects that tackled issues and barriers faced by people seeking to enter the professions through higher education. In 2006, funding was awarded to the Engineering Council for work that aimed to address the issue that working engineers who were eligible did not, for whatever reason, progress to become professionally qualified.

Over the past five years, a flexible pathway into and through Higher Education has been developed that enables an individual to become a professionally qualified (registered) engineer. The needs of the profession, the individual<sup>2</sup> and their employer were important considerations.

## Aims

The primary aims of the work were to:

- Develop and pilot a model pathway leading towards the professional registration of engineers in which higher education and professional development are combined through a work-based approach;
- To minimise the level of debt incurred by individuals whilst at the same time maximising their employment and earnings prospects;
- To attract to the profession those who might not otherwise have aspired to professional status;
- Target groups who are under-represented in the engineering profession at present;
- Help address the shortage of engineers and have a positive impact on retention;
- To engage employers in the development of the profession.

## The model

The pathway is based on a work-based learning (WBL) framework by which individuals may concurrently acquire and utilise underpinning knowledge, understanding and skills in work in order to meet the required academic and competence standards for professional qualification.

A more detailed description of the model is available at <http://www.engc.org.uk/engineering-gateways>

This report focuses on developments since publication of the Interim Review and achievements over the five year period.

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<sup>1</sup> Langlands, Sir Alan (July 2005) *The Gateways to the Professions Report*. Nottingham. Dept. for Education & Skills.

<sup>2</sup> The ‘individual’ is the person enrolled on this type of degree, so encompasses the terms ‘employee’ and ‘student’

## **Partners**

The project has been strongly collaborative, involving several key stakeholders:

- Higher Education Institutions (HEIs)
- Professional Engineering Institutions (PEIs)
- Employers and employers' organisations

For practical reasons, the number of partners was limited initially to four higher education institutions with experience of workbased learning and three professional engineering institutions.

Participation has grown significantly over the past two years and the following organisations are currently involved:

### **Higher Education Institutions (HEIs)**

Five universities are offering degree programmes:

- Aston University
- University of Hertfordshire
- Kingston University
- Northumbria University
- Staffordshire University.

At least five further universities have programmes in development.

### **Professional Engineering Institutions (PEIs)**

The three initial partners were: the Institution of Engineering & Technology, the Institution of Mechanical Engineers and the Royal Aeronautical Society. The number of participating PEIs has grown to twelve, with the following nine also having ratified the Registration Protocol with the Engineering Council:

British Computer Society (BCS)

Chartered Institution of Building Services Engineers (CIBSE)

Institution of Civil Engineers (ICE)

Institution of Chemical Engineers (IChemE)

Institution of Engineering Designers (IED)

Institute of Marine Engineering, Science and Technology (IMarEST)

Institution of Measurement and Control (InstMC)

Institute of Physics & Engineering in Medicine (IPEM)

Society of Operations Engineers (SOE)

The involvement of the PEIs has been crucial, particularly to ensure that the programmes are being designed in line with the PEIs' requirements and thus enable individuals ultimately to seek professional registration.

## **Employers and employers' organisations**

Several Sector Skills councils have been involved for varying periods over the five years: SEMTA, COGENT and EU Skills. ECITB has been actively involved for over three years by supporting individuals enrolled on the MSc Professional Engineering programmes at Kingston and Northumbria Universities and by serving on the Steering Committee.

Employers are involved principally by supporting their employees. This includes, for example, covering some or all of the university fees, ensuring that there are opportunities to engage in workplace activity that will enable the development of knowledge understanding and skills to meet the requirements for professional registration, providing mentoring, and providing other supervisory support. A range of size and type of employers is involved.

## **Participation and progression of individuals**

As noted in the Interim Report, the initial focus was on the development of masters level provision aimed at employed engineers who aspire to Chartered Engineer (CEng) status. By March 2010, 43 individuals were enrolled on MSc Professional Engineering programmes, which was perhaps fewer than had been hoped for. Since then, Aston University has launched its version of the MSc, including internationally. The overall numbers have increased significantly over the past twelve months to 75, including some individuals based outside the UK. In recognition of this potential demand, the Steering Committee has confirmed that the pathway should be open to those outside the UK and a statement outlining this position has been published <http://www.engc.org.uk/engineering-gateways/access-for-those-based-outside-the-uk>.

The first individual graduated from Kingston University's MSc Professional Engineering programme in January 2011. <http://www.engc.org.uk/news-list/new-masters-course-engineers-a-bright-future-for-first-graduate>

Student progression and tracking data gathered every quarter shows that there is a relatively modest accumulation of credit during the early phase of an individual's programme. This is probably explained by the time required to undertake the learning and competence mapping exercises. The rate of progression and credit accumulation tends to increase after this stage.

The Interim Evaluation suggested that the time taken for approval of the individuals' learning contracts by the PEIs was longer than might be expected by industry. This issue appears to have been addressed.

## **Supporting documentation**

A dedicated website has been developed (<http://www.engc.org.uk/engineering-gateways>) and a range of supporting material is available, for example guidance on mentoring and assessment, and a process map. A twice yearly e-bulletin is circulated to approximately 230 recipients.

Separate protocols have been established between the Engineering Council and PEIs, and between the Engineering Council and HEIs. These clearly set out roles and responsibilities.

<http://www.engc.org.uk/media/49369/registration%20protocol%20for%20peis.pdf>

<http://www.engc.org.uk/media/49342/protocol%20for%20participating%20heis%20and%20fe%20colleges.pdf>

## Case studies

The Interim Evaluation Report (March 2010) recommended that case studies be collected as these could be used in a variety of ways:

- To attract to the profession those who might not otherwise have aspired to professional status
- To reveal what employers and their employees felt about the importance of gaining chartered engineer status, and the 'value-added' to the company
- To provide material for more general marketing purposes

Six case studies have been collected, five of which have been published and are available at: <http://www.engc.org.uk/engineering-gateways/case-studies> Permission to publish was withheld in one case due to commercial sensitivity. The design of the case study template enables the views of the individual, their employer and their university to be captured together.

## Summary of case study feedback

All the stakeholder groups have responded very positively about the flexible pathway.

## Individuals

The feedback from individuals was particularly encouraging, citing both personal and professional benefits. There are some indications that the learning approach is contributing towards the development of engineers that have deep knowledge and competence that is highly relevant to the business. For example, the opportunity to underpin work based projects with masters level knowledge was mentioned, and the MSc submission requirements were cited as encouraging a deeper understanding of the subject matter and stimulating discussion with work colleagues. Other advantages cited by individuals included:

- The opportunity to work toward CEng status without leaving work
- Being able to (quote) '*seamlessly intertwine a full time engineering role within the organisation with the academic qualification of a masters*' (unquote).
- The support of an academic supervisor well as an industry supervisor to guide and advise how to align the course deliverables with the PEI requirements, to demonstrate CEng competence.
- The opportunity to tailor the programme to fit with an individual's needs, expertise and workplace activity.
- Affirming an individual's interest and aspirations to work in engineering.
- The direct relevance of the programme content benefits the company.
- The emphasis on self-directed learning, with the opportunity to identify an individual's strengths and plan a programme that ensures weaker areas are improved.

## Employers

Employers report that the MSc Professional Engineering has had a valuable impact on their companies. Employees on this programme have already undertaken a wide range of

activities of direct commercial benefit to their companies, and in some cases their work has opened up new avenues for the company. One employer also noted:

*Graduates Engineers contribute more and face a more competitive working environment than in previous years. There is an increased emphasis on empowerment and greater responsibility within early appointments. Graduate now have widespread responsibilities, hence the use of the MSc in supporting them and their training programme.*

### **Higher Education Institutions**

Universities have found it rewarding to work with individuals on this pathway, facilitating opportunities for their further learning and progression towards becoming a Chartered Engineer. Universities value the links with companies, and the depth and breadth of those relationships can be enhanced through the individuals on the MSc Professional Engineering programmes.

Academic supervisors welcome the opportunity to work with the in-company managers and mentors. This liaison is focused and has the advantage of relating to live company projects that form part of an individual's MSc Learning Agreement. Thus academics can enhance their awareness of current engineering practice, in a range of engineering companies. This can also provide useful examples for teaching purposes.

The universities have benefitted from being an Engineering Gateways partner by gaining recognition for being one of the pioneering universities to develop and promote the innovative work based route to professional qualification.

### **Achievements against project aims**

Most of the aims have been achieved:

A model pathway leading towards the professional registration of engineers is available in which higher education and professional development are combined through a work-based approach.

Individuals have welcomed the opportunity to work towards professional qualification without needing to leave employment and there is evidence of a positive impact on employment and earnings prospects

Individuals are being attracted to become professionally qualified, who may not have done so had they needed to leave employment.

The successful delivery of the pathway requires input from employers, who are thus engaged in the development of the profession.

It is too soon to say whether or not this flexible workbased approach will help to address the shortage of engineers, though the indications are encouraging. With regard to improving retention, the case study feedback indicates that participation in the MSc Professional Engineering has strengthened some individuals' commitment to the profession, with CEng status and promotion being mentioned as future aspirations.

An outstanding aim relates to attracting groups who are under-represented in the engineering profession at present. The focus so far has been to develop a model, secure validation by the universities and begin to offer programmes, and specific groups were not targeted.

## **Issues**

The Interim Evaluation did not reveal any suggestions for major changes, however a few issues were identified.

It was always recognised that conflicting pressures that could arise meaning that it could be difficult for an individual to meet their work commitments as well as working for a masters degree. Universities are putting in place support mechanisms to assist their students, though this type of programme will always require a high level of personal commitment.

With the increasing resource constraints, it is likely that universities will need to review how they deal with company visits and support for individuals.

For the PEIs, dealing with and approving learning contracts has been the main new process. Whilst this has not been too much of a burden with the relatively small numbers involved, this might change if the numbers grow.

Whether workplace activity can provide learning to masters level, offer opportunities for masters level project work and the appropriate experience to enable demonstration of competence will be confirmed only once more individuals graduate and undertake their IEng or CEng professional review.

## **Future activity**

The first application for chartered status from a graduate of the MSc Professional Engineering programme is expected in 2011. Assuming that CEng status is awarded, this will be a very significant milestone as will provide firm evidence that the pathway works, enabling promotion more widely amongst employers. It may be useful to target small employers in particular. They may not have the resources to establish structured graduate learning and training programmes on their own, and this pathway would provide a mechanism for them to do so.

An equivalent bachelors level pathway leading to IEng status has recently been launched by Aston University. This had always been an aspiration, though funding issues and identifying the target market have perhaps prevented further progress. However, recent changes in the UK's HE funding structure, such that part-time students will have similar access to loans as full-time students, may help to grow the market. Further, the more general promotion of workbased learning and employer provision may also have a positive impact and encourage individuals to work towards IEng by this pathway.

The Engineering Council's intention was that this would be an additional pathway for aspiring registrants and that it would be attractive to employees in particular circumstances and with specific requirements. It was not intended that this would replace any of the existing pathways to registration. The numbers are likely to remain small but that does not devalue the importance of this new pathway.

The Engineering Council remains committed beyond this five year period to providing support to the key stakeholders, with the aim of achieving increased uptake of this type of programme and wider, ideally UK-wide, provision.