

Engineering Gateway – Practice Transfer Partnership - Critical Success Factors

A review of Engineering Gateways Provider Universities: Critical Success Factors and recommendations for Adopter Universities, December 2011.

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1. Introduction

This investigation has been conducted on behalf of the Engineering Council in order to better understand the Critical Success Factors from the provider university's point of view for the Engineering Gateways Framework. This report is part of the wider HESTEM Practice Transfer Project: 'The PTP is aiming to produce an Engineering Gateways start-up tool kit that assists universities in getting started, including basic practical advice as well as case studies that illustrate elements of the Framework'.

The project aims at this stage are to:

- consult provider universities in order to better understand the Critical Success Factors for their existing programmes
- to make recommendations for topic content to be included in the start-up tool kit for adopter Universities wishing to develop Engineering Gateways programmes within their Higher Education Institutions.

2. Scope of this report

There are several key parties involved in the Engineering Gateways programmes: universities, employers, professional engineering institutions (PEIs) and the individual (employee/work-based student), with the Engineering Council playing an on-going facilitating and brokering role.

This report is not intended to cover all of these parties. While the successful development of the framework is dependent on the effective engagement of all parties, the focus for this report is on the current providers and their experience of development and delivery of their Engineering Gateways programmes, to include issues and challenges, and their views on critical success factors for future adopter universities.

3. Methodology

In order to carry out this evaluation senior staff (the programme leads) within each provider university completed a basic proforma detailing their programme details and issues to cover in the telephone interview. Semi structured telephone interviews were then conducted with all five current providers of Engineering Gateways programmes; Kingston University (KU), University of Hertfordshire (HU), Northumbria University (NU), Staffordshire University (SU) and Aston University (AU). Each interview lasted for up to an hour.

Table 1

Key Information Captured

- HEI experience of Work Based Learning
- Target participants for the programmes
- Key characteristics and structure of the programme
- Work Based Learning Frameworks used
- The roles of HEI, company, participant and PEI
- Infrastructure and resources required
- Intended learning objectives
- Methods of delivery
- Methods of assessment
- Recruitment of participants and any associated issues
- Accreditation methods and any associated issues
- Changes to the initial programmes made
- Monitoring and tracking of programmes
- Programme benefits to the HEIs
- Processes and critical success factors that have enabled the programmes to be sustainable

4. Issues and Challenges

Despite a few issues and challenges indicated by interviewees, all expressed enthusiasm for the programme.

“Going back to mid-90s we realised a lot of students wanting to study at MSc level couldn't attend uni due to commitments..... most working within engineering establishments and didn't really want to come to university.... they asked us if there was any chance that we could develop a programme where they didn't have to come into university but could develop themselves. We saw this as a good opportunity and it has been very successful.”

All provider universities are fully supportive of the programmes and are looking to develop their programmes further. Two universities show particular interest in the opportunities in international markets. AU is already operating successful programmes and SU is keen to develop these markets. Three of the universities (NU, HU, KU) raised issues relating to the scale-ability of the programmes and the need for better mechanisms to enable economies of scale to be achieved through higher numbers of enrolling students.

Two of the three universities (AU and NU) receive recruitment directly via engagement with employers rather than student-led enquiries. HU described student recruitment as low and will be looking to follow a more employer-led approach to recruitment

5. Critical Success Factors

5.1 Experience of WBL

The interviews indicated a range of WBL experience within the provider universities from delivery of only the Engineering Gateways Programme and Foundation Degrees to a broad range or suites of coherent WBL programmes including Foundation Degrees and non PEI accredited Masters programmes.

Whilst (we) recognised that this programme was one of a kind, our experience of developing FDs was useful experience to have within the school

Two (KU and NU) out of the five universities stressed the importance of a WBL Framework.

Despite in some cases there being no indication of synergy between non Engineering Gateways and Engineering Gateways programmes, there was an indication by some universities that a coherent and linked-up approach to delivery of WBL programmes was beneficial, linking Foundation Degrees to BEng programmes and onto the MSc Professional Engineering. Others highlighted the synergies between other MSc programmes with similar attributes for example an MSc in Advanced Technology (Engineering) and the Engineering Gateways programme leading to professional accreditation (CEng).

5.2 Effective programme set up

Interviewees were asked about the planning and design of their programmes within their discipline areas and asked to describe the process they undertook highlighting any key issues encountered and lessons learnt. Three respondents mentioned links to their university WBL Frameworks and the importance of these for the successful set up and delivery of their programmes.

(We) are fortunate that we have extensive experience in WBL delivery and all awards are administered under our Masters By Learning Agreements Framework which sets out clearly course structure; type of programme; infrastructure requirements to link with QA systems and student feedback.

Whilst not all universities had a WBL framework in place they did make reference to their formal validation process (set validation processes to include Market Research – prediction of target market, market demand and marketing strategy which would include market research and feasibility and costing of the programmes) and the importance of carrying out some key additional research with regards to programme set up to include mapping to the UKSPEC MEng learning outcomes and reviewing existing MEng programmes in order to develop a programme of best fit for their HEI.

Key was to look at the UKSPEC MEng learning outcomes needed to plug the gap and look at own experience of developing MEng programmes and to develop a programme to fit with our own Masters

structure. Each module aimed to try and address each of the UKSPEC learning outcomes.

Effective costing and pricing were described as areas for improvement – university respondents indicated issues around the costing and pricing of their programmes with regards to the actual costs of the Learning Agreements of the start of the programmes and the related expense of monitoring and supporting students on an individual basis. The need for costing models for the universities which differ from tradition models was stressed by all provider universities

5.3 Detailed yet flexible employer led programme structure

Whilst all provider universities have varied programme structures, the importance of flexibility and meeting the needs of all parties (employer, student and PEI) was stressed by all.

the system has to be very flexible so the modular system of 10 /15 credits would be unlikely to work as there would be so many of them and this would cause problems so we structured our course on modules of 30 / 60 credits. I think this has been one of the successful elements of our programme.

The need for early engagement of all parties via initial interviews to set expectations and assess the viability of an individual programme was critical to the success of the courses. One university made changes to the programme to have a PDA team carry out the set up and design of the individual PDAs for all courses to deliver a common message and ensure feasibility and viability of courses dependant on student and company attributes. Other universities preferred the route of individual supervisors interviewing both participant and company at the outset of the initial enquiry to ensure that the company has the relevant attributes required to support such a bespoke programme.

(we) hold a meeting at work to meet the employer and discuss the programme with the company , to ensure the company has the relevant attributes required in order for the student to have exposure to the relevant range of projects and activity to attain the required technical and professional competencies...

Three of the five universities highlighted the need to have a balance between having sufficient detail with in the programme to demonstrate the structure whilst recognising the need to be able to meet the changing needs and situation of an employer.

Good situation is to define projects in fair detail for first year, and for 2 and 3 year ensure enough detail for PEI and external examiner but to have a certain amount of flexibility to enable change requires, balance to be struck.

It is critical that the LC and PDA processes are streamlined to enable a bank of shareable templates to be developed to speed up the start-up process. Whilst all universities develop their LC and PDA in a slightly different manner, all expressed the benefits of developing LC and PDA templates which may be applicable for different students with different needs in different situations, another student in similar role to previous student.

At the moment we have got templates, so we can give students something to look at to work from and adapt to their own situation.

Number of templates has increased this has reduced start up time substantially, much easier to do as the number of students grow.

The alignment of the learning outcomes to the UK-SPEC requirements was recognised as fundamental to these programmes. Steps described included:

- take the modules as they are laid out in a generic programme specification
- develop a programme of specific Work Based projects to address the learning outcomes of each module and the specific descriptors for UK-SPEC requirements to be met
- trace how each UK-SPEC outcome is addressed by the projects
- package work so each module can be managed by one member of staff

5.4 University support for flexible WBL delivery

All provider universities run a fully WBL learning programmes although options for additional modes of delivery are welcomed where they are more suitable and meet the needs of the students in attaining their required competencies . One university is reviewing their WBL framework to enable a more flexible delivery of programmes to include more of a blended learning package to include face to face lectures and distance learning rising from direct requests from students to sit in some FT or PT lectures.

Whilst the delivery is primarily WBL as situated in students workplace ... in principle no reason why students can't pick up regular modules to study on a part time basis, or choose a suitable short course as part of the programme if they are suitable to the learner needs.

5.5 Effective employer engagement

All university partners expressed the importance of early involvement of the employer and clear channels of communication. There was also an emphasis placed on the necessary attributes of employers and the role they have to play in determining the scope of work within the programme is in line with their needs and expectations. An understanding of the level of commitment of the programme and that their processes and products are subject to critical review is essential. They must also be able to provide a suitable company mentor with relevant attributes who is open to this new style of learning.

the employer's role is crucial in formulating a programme just as for students the programme should develop around their required competencies - the programme should focus around the company agenda and how they want to develop their business .

One university made a specific recommendation for better employer involvement to enable employer access to the progress of the programmes via better open access to course information and expected outcomes and progress reports.

All providers described attributes of employers to include:

- the relevant level and type of engineering for the level of the programme
- engineering projects to include sufficient range for scope to develop WBL programme - cover design , analysis , management functions as well
- recognised support for the programme within the company (line managers to understand requirements for employee)
- clear understanding of expectations of the programme
- clear understanding of the business benefits of the programme

5.6 Early Engagement of the PEI

Effective communication with the PEI and engagement early in the programme was described as essential for effective delivery in order to meet the desired outcomes of the programmes which is for the student to attain CEng status¹.

The PEI is seen as critical in assisting the student to meet their professional aspirations and early engagement in approval for the Learning Contract and PDA is essential. A few of the providers described potential benefits of engaging the PEI early on to enable approval or otherwise prior to the detailed design and set up of Learning contracts and PDA

The process of getting a draft PDA and learning contract in place and then going through the external examiner then at that stage going through the PEI..... does seem that this process is the hardest and most risky if it is sent back for major modifications

¹ Unless the student in question is either already CEng or has an alternative route to obtaining the accreditation, and is pursuing the programme for other reasons. In these cases the accreditation and engagement with the PEI is of less importance.

5.7 Appropriate marketing for student recruitment

The majority of the providers have utilised traditional marketing strategies as follows:

- web platform presence
- direct targeted mail to Alumni
- discussions with employers via Industry Liaison Groups

Enquires from these channels have been student led enquiries either from university Alumni (student led enquiries) or from companies that the universities had prior links. Cohorts with the exception of two universities were small and had not increased in number over the years. Reasons given for this were the current lack of scale-ability of the programmes to achieve economies of scale.

Numbers have been kept low due to lack of current scale-ability for the programmes – need for more effective delivery mechanisms in order to sustain larger numbers in a cost effective manner

Interestingly the two universities who described enquiries being employer-led were the same two that utilised less traditional marketing strategies as follows:

- business development managers
- one to one company visits

Those that recognised the critical importance of seeing the employer as the client had higher student numbers. Two universities who currently receive student-led enquiries are looking to explore options of carrying out company one to one meetings to promote the programme and potentially buy in some employer engagement support.

5.8 Employer communication and reporting

Clear and defined formal communication channels were described as important for the success of programmes in terms of maintaining effective relations with the employer and also tracking the success of projects and being able to highlight projects and any arising issues in time to deal with them effectively. A barrier to communication with employers highlighted by one university can be issues over data protection and the inaccessibility of university learning platforms. Employer communication via annual progress reports on the programmes actual progress against expectations has proved effective with employers in demonstrating the value of the programmes.

Performance criteria for the programmes were developed with companies for annual reporting on progress. Assessment of a programme against perception of quality and achievements on programme in order to assess and report the value of the programmes to the employers.

All universities highlighted effective communication as a critical success factor and two of these respondents clearly indicating the need to assess appropriate language used to describe programme content in line with employers' vocabulary.

5.9 Academic Staff Buy-in

Key to the programmes mentioned by all providers is support from academics to supervise and carry out assessments and engage in the programmes. Most universities highlighted overall support by academics for the programmes and hinted at a few internal problems along the way which could be overcome via a few strategies including getting early buy in, making sure workloads are recognised and clearly stating the additional benefits which may come from the employer engagement within the programme (KTP, R+D opportunities)

carrot was to get staff interested in company engagement on board ... engage staff interested in engaging businesses, not all are

Academics need to be adaptive and be able to work with new systems and mechanisms for supervision, administration and mentoring internally to support the programme.

5.10 Relevant Company Support

The company must provide an effective and suitable company mentor, the HEI must be able to provide clear guidance on the attributes required for an effective company mentor. Providers described the following attributes:

- CEng status
- Good understanding of future company projects
- Good listener
- Open to a new style of learning
- Willingness to undergo mentoring training as necessary

All universities highlighted the importance role that the academic institutions play in defining the role of the mentor and providing guidance to them in the form of handbooks, guidance or training.

6. Recommendations of issues to consider

Factor	Things to consider
Work Based Learning Framework	<ul style="list-style-type: none"> ● Review of other WBL provision ● Potential synergies between other courses ● Alignment to WBL strategy
Effective Programme Set up	<ul style="list-style-type: none"> ● Usual Validation Process ● Non Traditional Cost Model ● In depth market research ● Early involvement of all stakeholders ● Relevant attributes of all parties ● Company Attributes (Suitability of company; breadth of projects , company mentor with relevant experience) ● Student Attributes (suitability of participant ; experience and appropriate entry level) ● HEI Expertise ● Early involvement of PEI ● A academic supervisor will have clear oversight of the programme so that it is able to deal promptly with issues and concerns A process is established to ensure that any actions required are taken forward by the appropriate partner ● The Work Based Learning Programme content to be determined at a very early stage so that companies and participants are aware of the level of commitment required .
Effective communication	<ul style="list-style-type: none"> ● Determine communication strategy from the outset ● Appoint HEI supervisor to co-ordinate ● On-going communication with employers is vital – don't just leave them to it! ● All appropriate partners must be involved in planning individual programmes and reviewing their progress ● Hold supervisory meeting with HEI supervisor , participant and company mentor as early as possible
Tracking and monitoring	<ul style="list-style-type: none"> ● Identify from the outset who will have overall responsibility for target setting, etc. ● Ensure that all appropriate partners are aware of their responsibilities in terms of contributing to this process ● Develop clear individual learning contract at the commencement of the Work Based Learning Programme and communicate this to all relevant partners

	<ul style="list-style-type: none"> ● Ensure thorough and regular tracking of each participant by the HEI supervisor ● Involve employers in tracking and monitoring progress ● Enable participants to feedback on their experiences and recommendations to improve the programme. ● Tracking systems
Student Recruitment	<ul style="list-style-type: none"> ● Ensure existing company partners are contacted ● utilise a mix of marketing strategies dependant on if student led / employer led enquiries
Academic Buy In	<ul style="list-style-type: none"> ● Ensure academic staff fully understand the Work Based Learning Pathway programme and possess the right qualifications and engineering experience as appropriate ● Engage academic staff with prior experience of working with companies and engaging in third stream activity