Engineering Gateways – Practice Transfer Partnership

Report on survey of adopters, November 2011

Report compiled by Rob Best, CEng

The aims of the stage of the PTP project reported here were to

- understand the challenges and/or barriers perceived by the adopters to the development and implementation of degrees according to the 'engineering gateways' framework at their university
- based on the information obtained, produce a summary report of the perceived barriers/challenges with recommendations to inform the development of the proposed 'toolkit'.

1.   The survey

Five universities have signed up to the project, namely

Coventry (C), Derby (D), Greenwich (G), Leeds Metropolitan (L), University of West England (B) [NB letters in parenthesis are abbreviations used in the report below]

Senior staff involved in the development were interviewed at each university during the first two weeks of November 2011. Each interview lasted from1 to 2 hours and the following topics were addressed:
- context and background for the university,
- planning and validation issues,
- employer engagement,
- accreditation and standards issues,
- support mechanisms for students,
- assessment, APL/APEL.

2.   Current position

All five universities are aiming for the MSc/CEng programme[1]. Three (not D or G) are interested in the BEng/BSc/IEng but foresee significantly greater challenges in this level, so anticipate developing this at a slower pace.

The engineering discipline is clearly defined in three cases: Building Services Engineering for two universities (L & C), Aeronautical Engineering (B). For D and G the discipline is less clearly defined, though D is looking at Civil/Mechanical/Electrical in relation to railway engineering

Planning and validation issues

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[1]   "MSc Professional Engineering" abbreviated to "MSc PE" in the rest of the report.

Whilst all have accredited programmes in the disciplines of interest, the respective PEIs have not to date been closely involved in the present development. Most are planning to go into this more in the near future. There is some concern that accrediting panels may not be wholly sympathetic to the WBL approach (two adopters mentioned the IET in this context).

One of the five adopters (C) has already had their programme validated by the university, two (D & G) are expecting to complete this stage early in the New Year, the other two (L & B) later in the current academic session.

None of the adopters is too concerned about costs and viable numbers. Most are aiming for at least "double figures" – say 15+. However, some expectations appear ambitious (e.g. 25 students enrolling each year). Staff resourcing is seen as more challenging - management rather than quantity - because of the different style of T&L and the need for changed practices.

All have some experience of operating distance-learning or WBL studies, so none anticipates significant problems with the relationship of the new programme to existing university philosophy.

Employer engagement

Contact with employers and students is at varying stages of development, particularly through Advisory Panels and other networks. There are varying degrees of experience of working with mentors, in some cases well-established. Most perceive mentoring as the biggest challenge, along with convincing employers of the value of employees studying for the qualification. All would welcome further support as set out below.

Accreditation and standards issues

All are familiar with UK-SPEC though none had been aware of the new statement of learning outcomes for non-MEng masters programmes. Some perceived that there may be a challenge in aligning individual outcomes to defined course modules, though others (C & D) have already worked out how to do this. Guidance would be welcome.

The degree of PEI engagement varies from discussions in progress to very little contact to date. There appears to be limited understanding of how PEIs will interact at the pre-accreditation stage (i.e. in the Professional Development Audit (PDA) and setting up the Learning Contract (LC)).

Support mechanisms for students

These appear to be fairly well developed in all five universities and not a concern. The kind of support envisaged varies from direct contact by academic supervisors to managed distance-learning.

Assessment, APL/A

APL/APEL issues are held to be straightforward, with all adopters having mechanisms and experience in dealing with these for WBL study.

Similarly, all have well-tried mechanisms for assessing project work and for detecting plagiarism and other forms of unfair academic advantage. D mentioned their use of "PebblePad" (http://www.pebblepad.co.uk/) - an on-line portfolio management tool – which they use to help student, mentor and tutor to keep track of the student's work and

view comments made by the tutor and mentor. A further tool which had proved useful (to G) in this context is the use of "witness testimony" (by managers or workplace supervisors) – it requires more effort by the company but was received well once established.

One university (D) saw overseas as a potential market but, conversely, two (G and C) felt it would be too resource intensive and potentially problematical to be viable.

3.   Concerns and challenges

4.1. The IEng route

Whilst interested, most foresee significantly greater challenges for implementing IEng programmes, even though these could be of greater interest to SMEs (not sure why?). Reasons for this include that the universities cannot visualise candidates, as they would be from much more diverse backgrounds than for the MSc PE (e.g. non-university, such as FE or apprenticeship) and in need of far greater support academically as they would be under-prepared for self-managed reflective learning (MSc students have developed this through BEng studies).

4.2. Accreditation, PEI recognition and engagement

There is some concern that accrediting panels may not be wholly sympathetic to the WBL approach or whether they will really understand the nature of the MSc PE. In other words, that a poorly informed or unsympathetic panel might give an unfavourable accreditation outcome after a lot of effort put into the programme. Evidence presented in support of this opinion was mostly in the form of comments by one or two accreditation representatives, although it was felt that one PEI in particular has an expectation of sufficient "hard maths" assessed by examination. They all realise that accreditation cannot be granted until the first cohort has graduated, though one stated "I can't see how PEIs would accredit". Since any accreditation would only be confirmed 3 or 4 years from the start of operation, there may be difficulty gaining credibility for the MSc PE route.

There has been little or no discussion with PEIs about PDAs and several said that they would welcome guidance on PDA and development of the Learning Contract.

Adopters would like to see stronger, more direct evidence of PEI support, one summarising the imbalance as "the University receives payment and thus has to deliver, whereas a PEI could duck out if they lost interest or had too much other work". Suggestions for how support could be improved include publicly listing details and contacts for the PEIs who are really on board, well-presented case studies and a commitment by PEIs for regular checks on progress in the agreed MSc PEs.

4.3. Resources

Although no adopter sees particular difficulty with costing or resources, there is clearly awareness that these could become an issue. Some universities do not recognise the difference of the MSc PE from standard courses or CPD, which presents problems against the background of fee changes. It is recognised that WBL can be resource intensive (which has to be seen in the context of increasing cost consciousness in universities), arising from
  · management of multiple companies;

- the need for sufficient contact with students & companies (currently often through personal visits, mainly because the WBL approach is new);
- travel time;
- employers being demanding and having very high expectations;
- WBL activity being 52 wks/yr, not termly like most other academic activity.

A further but possibly rather general problem is how to get resources released by the university early enough to support programme development, particularly as there tend be rather few people with the specific knowledge of how to implement this sort of course.

Tools are needed to help deal with all above. Most felt that it would be useful to see how the issues are handled elsewhere (though confidentiality may make this difficult).

4.4. Academic staff buy-in

Staff awareness and buy-in are likely to be more problematical. Staff will need to think and work differently – facilitation not didactic – more established staff may find this harder to take on. Things that would help include
- good supportive messages from PEIs etc;
- making the route more high profile - "role models" etc;
- seminars to inform staff and employers to help overcome risk aversion.

4.5. Employer engagement and attracting students

There is a general view that the MSc PE needs to be sold more strongly, both to employers and to potential students. Selling it to employers alone may well not deliver many students – individuals must also be made aware! There is also the challenge of finding the right influential/strategic/decision-making people in large companies (less of an issue in SMEs). In some areas it can be difficult working with SMEs but regional trade associations can help.

There is general support for a "brand" to tap into (not necessarily "MSc Professional Engineering") so that interested students can identify what they need and relate it to the company's aims. The issues are, for employers:
- what the MSc PE route is;
- what employers would be buying into and need to put into it;
- benefits and advantages of WBL to the employer (i.e. student is always at work; projects can provide useful insight to the company etc) but also how to deal with departures from their normal practice;
- fears of loss of staff with enhanced qualifications to competitors;
- the more general issue of maintaining international competitiveness of UK plc through a well-qualified workforce.

And for students:
- what the MSc PE route is and what they would be committing to;
- benefits to students;
- what alternatives are on offer, i.e. what kind of programmes are available and where they are run.

Suggestions include:
- leaflets, website etc;
- Engineering Gateways Newsletter could be used;
- a user network for people operating MSc PE (ESC/HEA - Simon Steiner?);

· PEIs could play an important role in assisting candidates to get information. This information could be provided by Engineering Council or PEIs.

4.6. Student support, especially mentoring

Most perceive the recruitment and management of company-based mentors as the other big challenge. The difficulty in finding mentors varies greatly - some companies have experience in mentoring but it is new to others and these then look to the university to provide information and support. The toolkit could help a lot with this.

Some adopters already have a system for mentoring, including a handbook for company mentors (and for students). The company is asked to sign up to an established system and the university gives training for mentors where this isn't given by the company.

Several issues were identified, including:
· the need for practice handbooks for mentors and academic supervisors;
· mentor training and building the relationship with mentors;
· developing common standards for mentoring and the desirability of consistent practice within a university and possibly across the MSc PE providers;
· supporting students who were not already graduates of the host university or even the particular engineering discipline;
· communicating with students;
· dealing with employees or mentors changing job;
· establishing a level of ownership in the engineering sector as a whole, as has been done in Construction Project Management;
· in one case (C), confusion between an employer-based mentor and an external (PEI) professional mentor ("Aston model").

A checklist could help with all the above and related matters.

4.7. Aligning UK-SPEC learning outcomes to the course module outcomes

Some perceived that aligning individual outcomes to defined course modules may be a challenge, though others (D & C) have already worked out how to do this. Several stated they would welcome guidance on this or at least to benefit from the experience of other universities.

The issue is that, for internal approval purposes, universities need to define courses in terms of modules with clearly defined learning outcomes, in this case mapped to UK-SPEC. The challenge is to be sufficiently specific about how the learning outcomes will be achieved whilst leaving sufficient flexibility for this to be through WBL and the Learning Contract. The PDA and LC are key to the process but it is recognised that for some candidates (particularly their own graduates) the LC will be more straightforward while for "non-standard" applicants it may be a problem. It was suggested that PEI Branches could do a lot more to help with all this.

A further anticipated challenge would arise where a student changes job or an employer changes projects, rendering the plan for the LC difficult to achieve in its agreed form.

4.   Recommendations for development of the toolkit

Four categories of support are identified:
· Mutual support and sharing experience
· Publications

- Checklists
- Profile raising

5.1 Mutual support and sharing experience

There is a general request for more exchange of information with existing providers and adopters. Possibilities include:
- Arrange for someone with experience of successful operation of MSc PE to be mentor for each adopter.
- Set up a forum in which to discuss issues (this could be on-line or an occasional meeting).
- Improve the case studies. The published case studies are useful but adopters would like to see more objective input from each component - employer, student and university (plus the PEI?)

5.2 Publications

A "brand" and improved information are needed (not necessarily using the name "MSc Professional Engineering") to inform employers and students. This can be achieved via a website and/or by a well-produced information leaflet, addressing the points set out in paragraph 4.5 above. The publication needs to take into account that many non-engineering companies (e.g. food and paper industries) employ engineers and often don't really understand the requirements of engineering professional development. Also, companies like to have information on how other companies do things

Guidance and support (or at least a checklist) for PEIs and universities on the development of the PDA and LC are needed. Actual development of PDAs and LCs could be done through PEI Branches.

It was suggested that developing common standards for mentoring would help but this should probably be a longer term goal. However, guidance notes on mentor recruitment and working would generally be welcomed.

5.3 Checklists

Universities would like checklists of essential points/good practice for most areas, especially:
- Approaches to companies
- Recruitment of and working with mentors (see paragraph 4.6)
- Student support

5.4 Profile raising

There was strong support for more evidence of support from PEIs and a higher profile for the MSc PE route. Evidence of commitment by PEIs is needed in the form of:
- a published list of the PEIs who are really on board
  - to include a named contact in the PEI or other up-front visibility of commitment to MSc PE;
  - well-presented case studies;
- high visibility for the MSc PE and info on what interested candidates should do next, advantages of MSc PE etc;
- a regular (e.g. annual) commitment by the PEI to check progress is OK.

- PEIs could play an important role in assisting candidates to get information.

Whilst there is broad interest in the IEng route, it looks unlikely to progress without significant stimulus from a PEI and the Engineering Council.

RJB, November 2011