Engineering Gateways Workshop

HELPING DEVELOP CHARTERED ENGINEERS
THE KINGSTON UNIVERSITY EXPERIENCE

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Royal Academy of Engineering, Sept 2013
Engineering Gateways at Kingston University (KU)

• Today’s workshop:
  • background to Kingston University (KU) scheme
  • reflection on first 5+ years – over 60 professional engineers
  • focus on factors affecting progress of the participants
MSc Prof Eng scheme at KU

- **Primary target:** the *academic* requirements for CEng
- Parallel target: develop professional competence, CEng
- KU: fully work-based learning, engineers still working full time (can do taught module for part of it)
- KU: 13 years experience, across several Faculties – so University level quality framework for work-based MScs.
- KU involved in Engineering Gateways from start - lead university in pilot stage
Basis underlying MSc Prof Eng

- Professional engineers working *at or approaching CEng level* are undertaking activities that
  - also involve masters level learning,
  - and/or provide a ‘springboard’ for it

- We have found this to be valid, from experience to date
- Generally a springboard - all have to study beyond their normal work to get our MSc.
Basis – found to be valid

- Also found engineers much **below this level** have difficulty satisfying our requirements for this type of MSc
  - Similarly with a limited variety of work at the level.

- We try to filter them out at application stage
- 2 years experience before starting is normal entry requirement for this (+BEng/BSc). *Implications for IPD schemes.*
KU: Formal Learning Agreement

- Fixed Entry & Exit Gateways (15 & 60 credits)
- Individually developed modules (105 credits: 180 total)
- LA: MSc Plan developed in entry gateway, by liaison between university, student and employer
- Built on their work activities – ‘springboard’
- Each LA has formal independent review and acceptance under the university quality management process
PEI Review & Acceptance

Kingston Experience:

- Individual case basis - Engineering Council’s Protocol
- Provides useful feedback to us + confirmation acceptable for CEng.
- PEIs constructive and supportive of the route,
  - but it is new and unfamiliar to many involved at PEIs (particularlyly volunteer members), and to new PEIs involved.
  - Mutual uncertainty at beginning (each beginning!).
- We respect the caution and different ways of working
PEI Review & Acceptance

- MSc understood helpful for PEIs –
  - the planning and assessment of performance of the FL is done by KU, to university quality regime.
  - Much easier for PEIs than dealing with individual member FL plans.

- NB. Taught MSc typically not an option for these engineers; (geography/time off work/£££). If not work based MSc, they would typically neither learn as much nor become CEng.
PEIs of engineers this year

- IET
- IMechE
- RAeS
- ICE
- IMC
- IFireE
- Other enquiries and liaison re: IChemE, IofWater, CIWEM, CIHT, IMarEST, IOM₃, IRSE, CIBSE
Team available at Kingston

- Academics in the Engineering Schools, incl CEng
  - Mechanical and Automotive (incl fire & explosion)
  - Aeronautical
  - Civil and Construction
  - (Electronics embedded in Aero & Mech)
- Academics in other Schools (e.g. CIBSE members)
- Team of highly experienced specialist consultants with strong links to their PEIs – a great ‘Gateways’ benefit
MSc Prof Eng at Kingston

- 66 students have started, first 3 in Nov 2007
- 14 MSc graduates (1st in 2010)
- 5 already achieved CEng, other applications underway
- 22 currently enrolled
- 30 withdrawn (45%), of these:
  - 21 (70%) started in pilot stage 2007+08,
  - 9 subsequently
Student data

- Primary motivation (survey): to progress to CEng
- Graduates: generally after 2.5 to 3.5 years, some up to 5 years.
- Age range typically 25 to 35, with several older & a few younger (when starting)
- Large majority are employer funded – a very positive factor, reflecting them continuing to work full time
Investigation into reasons for withdrawal

- 33%: made redundant or job change or employer funding for MSc ceased
- 17%: CEng by another route (e.g. Royal Engineers, Career Learning Appraisal)
- 17%: Time for MSc + work + family = too much strain
- 20%: not suited to work-based learning approach
- 13%: not known (very early years)
- Reduced greatly since pilot stage – but still occurring
Rate of Progress

- Often slow initially, speeding up considerably towards completion
- Some bunching of credits towards the end is expected: work projects take time to mature – so later write up
- Not all due to ‘bunching’
- Other reasons investigated
Factors impeding progress, identified by study:

- MSc submissions required were markedly different from their usual reports at work, e.g.
  - work reports often heavily reviewed by seniors before issue
  - rarely mention themselves in work reports and never their personal learning (always project focus)
- unfamiliar with academic techniques and assessment criteria, or lacked attention to them
Some factors impeding progress:

- Critical reflection and evaluation found challenging to develop (but glad of it later!)
- Uncertainty about requirements expressed generically and/or in academic terminology led to disinclination to expend effort that might be wasted
- Perception very large amounts of work were needed for every module, e.g. an entire project to be reported
- Tendency to focus on project details in reports, rather than their learning
Some factors impeding progress

- High workload at work – made worse by recession pressures at the time, led to deferral of MSc submissions to a less pressured time.
- That deferral exacerbated by extent of flexibility of submission dates then operating on our scheme.
- Students engagement reduced away from their normal workplace, particularly overseas when face to face contact with our supervisors not practicable.
- Time pressure from family change e.g. house move hassle, birth of additional child.
Flexibility – pros & cons

- Essential e.g. due to employer project changes
- But can be too flexible e.g. on dates
- We now aim for a stepped sanction approach to submission dates
- Individual, detailed Learning Agreements are resource-intensive to prepare (but helpful to students and employers it seems).
Measures to improve progress

- Additional information and support targeted at factors we could influence
  - Academic – often enhancing their understanding of what needed, and their confidence. Helping study skills. (often out of practice)
  - Improved guidance and reminders on required content (incl limits), to improve their focus on requirements for that Module submission
  - Pastoral - e.g. flexible re work and home pressures, (even impact of new baby!)
Measures to improve progress

- Greater involvement of new students in the detailed planning and wording of their LA has increased ‘ownership’ and understanding. (Not quicker!)
- LA planning tools have improved their reporting focus
  - e.g. which particular KU masters level characteristics did I plan to show in this module? Write the submission accordingly.
- Flexible dates but stepped sanctions
- Reminder of grade criteria (What will earn an ‘A’ Grade?)
Measures to improve progress

Examples - What’s needed?

- Analogy of Module assessment criteria to engineering Specification / Client Requirements helped many – plan to satisfy all the Specification

- Project information/examples needed only as context & evidence for demonstrating Module assessment criteria. Focus them - full report on project neither needed nor helpful.
Measures to improve progress

• Briefing on the degree of ‘perfection’ required. e.g. going into new learning areas, they wanted to be as sure and close to perfect as they would be for a project.

• The extent of detailed feedback seems valued by most.
  • feedback given on one draft (if wanted), then final
  • feedback also formative for future modules
  • One to one supervision sessions – at the workplace, & employer/mentor engaged periodically
Measures to improve progress

- The improved focus made the modules appear more clear and manageable - less daunting, so more done

- Increasing the significance of submission deadlines improved attitude and compliance

- Highlighting potential risk of employer funding ceasing - motivated most students (but not all!)
Measures to improve progress

- Introduced tracking *interim* progress at supervisor sessions – slow progress and project delay issues highlighted earlier, so remedial action started sooner
- For each module we track % progress of:
  1. *work activities* needed for the module
  2. Preparation of its *submission documents*

- Identification of work projects with potential for early reporting has helped reduce ‘bunching’ later
Measures to improve progress

- Introduction of web-based video calls e.g. by Skype, improved engagement when temporarily away/overseas (full time o/seas can’t start our MSc Prof Eng)

- Greater scrutiny/filtering of applicants, with our increasing experience of what works and what doesn’t
Employer feedback to us

Strong positives cited by many employers:

- high relevance of the modules to their type of work,
- timing flexibility so key work dates less impacted
- their staff continuing to work full time
- Some also reported a benefit of their engineers learning new/better ways of approaching their work

- I also know that funding support by ECITB has been hugely positive. A credit to ECITB.
University engagement with Employers

- Good relationship development with engineering companies – we are helping their valued staff develop
- Interaction of university supervisor staff with current live engineering projects – enhances staff awareness
- Considerable opportunity for other collaboration
- NB these engineers are permanent employees, not placements by the University
Where are we now?

- 14 graduates
- 5 of whom are now CEng, with more in the pipeline
- Very positive feedback from many students
- Many engineers who think and do their engineering better – (feedback from them and their employers).
- Many graduates taking a ‘breather’ before CEng app’n.
- Work based learning very good for engineers suited to it, unsuitable for those who aren’t, or haven’t got suitable work opportunities.
Where are we now?

- Threefold increase in the rate of progress since early pilot period, but we still seek improvements
- Small numbers involved – quality / quantity
- Useful Eng Cncl links to ‘community’ of universities & PEIs sharing ideas
- A useful addition to routes to CEng for many engineers
- (is it more demanding than some other routes??)
Outcome – work in progress

First UK MSc Prof Eng Graduate: Nov 2010 - planning to apply for CEng late 2013.

I contact the graduates periodically to ask about their progress to CEng and remind them of support available from PEIs and our consultant team.
Outcome: 1\textsuperscript{st} CEng - at IET 2012
Outcome - Are we helping develop Chartered Engineers?

- Yes. Helping:
  - their learning – technical deepening and broadening,
  - their thinking skills, (including critical reflection & evaluation, to drive engineering improvement)
  - provide evidence of their learning for CEng registration.

- In a different flexible way, whilst working full time and/or remote from a university.
Scope for improvement?

- Yes, certainly!
- That’s our aim
- Including learning from others today