

Engineering Professors' Council

50th Anniversary Policy Forum, 20 May 2009

Workshop on Sustainability Issues

The following is a summary of opinions and recommendations from the four workshop groups that considered sustainability:

We cannot wait for evolution; sustainability requires a culture change and has to be embedded within the curriculum, not only for taught programmes but also within the research environment and programmes. EPC can provide leadership so as to foster awareness, staff training and development along with sources of knowledge and good practices.

Sustainability is complicated and not fully understood. It is all encompassing from global issues on warming, energy, food and population growth down to local and personal issues such as recycling and choice of lifestyle. Students have an expectation that sustainability and ethical issues will be within the curriculum. Most courses avoid the broad and general issues and look at the more technical questions and solutions but a too rigid isolation is not desirable as all issues are linked. The treatment of the topic does vary with discipline with, perhaps, Civil Engineers looking more at 'technology' compared to a 'broader' view taken by Chemical Engineers.

It is generally agreed that the approach to sustainability should be 'bottom up' rather than 'top down', local issues may be better for engagement rather than too broad and general global considerations. It must be embedded within the curriculum and not offered as an 'add on' taught unit, it is considered to be of equal importance with other elements but not of equal weight. To embed sustainability within a programme requires a culture change, there is a need for upgrading the skills of academics so that the topic is taught and learned within a professional environment. Some universities have introduced academic 'champions' and 'pioneers', also dedicated centres of expertise offering a service to Schools and Departments. Funding has also been obtained through SERC for 'technical' issues. To date staff involvement has mainly come from those who have relationships with industry rather than from 'scientific' researchers. There is a need for staff development on sustainability issues and the professional responsibilities of teachers and researchers.

Many engineering programmes have a significant overseas student population and the approach to sustainability teaching needs to recognise the cultural and ethical differences that will exist. Staff should be non-judgemental and attempt to recognise the multi-cultural and multi-discipline influences of ethics and sustainability; social and other issues are important. The international aspects are necessary if the UK is to continue leading the international education agenda and hence attract overseas students.

The teaching of sustainability may best be undertaken through active learning processes. For example these could include team and inter-disciplinary projects, case studies, workshops, interactions with work based learning and experiences (including vocational experience). Two examples were discussed. In the first case sustainability and international issues are taught and assessed in a unit that is credit bearing (ECTS) but not used in the Honours degree assessment. The main problem is organisational as the unit is outside of the traditional timetable but the credits are listed on the transcript. In the second case a centre for environmental strategy was set up in 1993 and develops industry/academic/research linkages. The staff from the centre teach on UG programmes and contribute experience to projects and similar activities.

The EPC working group on sustainability could consider the following actions:

1. How to demonstrate leadership in developing sustainability in the curriculum
2. Define sustainability in engineering education and thus clarify the aims and objectives
3. Consider the options for teaching and methodology, e.g. 'top down' or 'bottom up', formal taught units or general embedment, 'broad' versus 'technical' contents etc.
4. How to develop the necessary culture change for awareness in ethics and sustainability.
5. Expanding the culture to include research.
6. International issues and overseas students; cultural and ethical issues in the teaching of sustainability. The promotion of UK education as the international leader.
7. Teaching and learning processes in sustainability
8. Links with other bodies, e.g. the engineering subject centre, engineers without borders etc.

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Reference: Guidance on Sustainability for the Engineering Profession. ECuk May 2009 – see http://www.engc.org.uk/documents/EC0018_SustainabilityGuide.pdf