

# Basing Course Design on Learning Outcomes: Workshop

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Programme Leaders are expected to be able to demonstrate that students are offered the opportunity of achieving the learning outcomes specified in the UK-SPEC Output Standards. Programme Leaders are further expected to demonstrate how the learning outcomes at programme and module level map onto the UK-SPEC learning outcomes. This assumes that courses are designed and structured in a coherent fashion.

This Workshop will focus upon course design using learning outcomes, and will offer participants the opportunity to explore the issues involved in this process.

By the end of the session participants will: be able to describe the issues involved in course design based on learning outcomes; have a better understanding of the need to map module and programme learning outcomes to each other and the UK-SPEC; have experienced an activity through which they have begun to engage in a programme design process; and advise course and programme teams on the essential characteristics of a programme design that meets the output requirements of the UK-SPEC.

The session activities will include: a brief introduction on design for assessment using the UK-SPEC; breakout group activities that involve designing a programme that meets the UK-SPEC, a module for that programme with learning outcomes that contribute to the programme learning outcomes, and an assignment and criteria for assessing the module learning outcomes; and a final plenary where group activities and outcomes will be shared and evaluated.

## BACKGROUND

Learning Outcomes describe the knowledge, understanding and skills that graduates are expected to have demonstrated in the course of completing a programme of study. For Engineering programmes in the UK these learning outcomes are expected to match the General and Specific Learning Outcomes expressed in the UK-SPEC as described in the Engineering Council UK's publication, 'The Accreditation of Higher Education Programmes (May 2004).

On the basis of strong support from the UK engineering academic community to work towards a single unified standard for Engineering degree programmes, the Quality Assurance Agency for Higher Education (QAA) invited the Engineering Council UK, the Engineering Professors' Council, The Higher Education Academy Engineering Subject Centre and other key stakeholders to review the QAA's Subject Benchmark Statement for Engineering. The review group concluded that given the evolutionary nature of the development of the UK-SPEC, the contribution provided by all key

stakeholders to the development of the UK-SPEC, and its widespread acceptance by the engineering academic community, that the UK-SPEC should be adopted as the revised subject benchmark statement. Thus, the revised Subject Benchmark Statement for Engineering adopted the current UK-SPEC standards, and was published in 2006.

In the UK Engineering degree programmes are thus expected to have learning outcomes which align with the UK-SPEC / QAA Subject Benchmark Statements. Moreover, degree programmes will only be accredited if they can demonstrate that they do.

This move towards output standards as reflected in the UK-SPEC mirrors parallel developments internationally, such as with the European Qualification Framework, the EUR-ACE standards, the Washington Accord, and ABET outcome standards.

## **COURSE DESIGN: BOTTOM-UP or TOP-DOWN**

### **The Bottom-up Approach**

When designing a programme from the bottom-up programme designers will tend to consider what knowledge, skills and abilities students have on entry to the programme and will build a programme on the basis of offering opportunities that will enable each student to build upon his/her knowledge, skills and abilities. With the rise in the expansion of routes to entry to higher education, this has become more difficult as the profiles of students on entry has become more diverse.

Traditionally, programmes that have been designed from the bottom-up allow students to select appropriate routes through the programme that enables them to build upon their existing strengths. The key disadvantage of this approach to course design is that it is difficult to ensure that a student completing the programme will be able to demonstrate that they have met the output standards expected of a course meeting the UK-SPEC General and Learning Outcomes.

### **The Top-Down Approach**

With this approach the programme designers begin by describing the expected outcomes of the programme (programme learning outcomes). These would usually be expressed in terms of the knowledge, understanding and skills that students who have successfully completed the programme should be able to demonstrate. Once the programme learning outcomes have been defined, it should be possible to build/select modules for each of the levels of study. Modules should only be included in the programme if they provide an effective contribution to either the curriculum area or to the programme outcomes. If they are essential contributions, then they should be core modules, otherwise they may be optional modules.

For each module selected for the programme detailed learning outcomes should be established as well as the means of assessing the attainment of these outcomes. In a programme designed in this manner, achievement of module learning outcomes should ensure that programme learning outcomes have been met. Providing that programme learning outcomes were aligned to the UK-SPEC, a top-down approach to programme design should ensure that the programme is compliant with the UK-SPEC and the QAA Subject Benchmark Statement for Engineering, and meets the standards required for gaining accreditation for a course.

Whilst a top-down approach clearly has its advantages particularly in terms of the clarity of outcomes, it does suffer from the potential disadvantage of compelling a

student through a prescribed route and at a defined pace. Students may not have the opportunity to study at an appropriate pace for themselves or to achieve learning outcomes (outside those proscribed) that may be important to them.

One means of reducing this potential effect is to design the course in such a way that different emphasis might be placed at different levels of study. Thus at level 1, the emphasis of a programme might be on consolidating existing knowledge, understanding and skills. At level 2, students might be encouraged to develop their skills and apply their knowledge and understanding through means of analysis and syntheses of knowledge. At higher levels, students might be encouraged to develop greater independence, gaining authority/mastery over their subject as they apply critical reasoning and judgement in the application of their knowledge and understanding to real-life situations/problems. Thus, though a top-down approach might be the preferred approach to course design, it can still be done in a manner that enables students from diverse academic backgrounds to progress at an appropriate rate and to attain the programme outcomes.

(For a detailed discussion of the merits of a top-down approach to course design readers are encouraged to read Section 2 of the Engineering Subject Centre Guide "Assessment of Learning Outcomes" (July 2005):

[http://www.engsc.ac.uk/downloads/scholarart/learning\\_outcomes.pdf](http://www.engsc.ac.uk/downloads/scholarart/learning_outcomes.pdf)

## **WORKSHOP: POTENTIAL LEARNING OUTCOMES**

By attending this Workshop participants can expect:

- To be able to describe the issues involved in course design based on learning outcomes
- To have a better understanding of the need to map module and programme learning outcomes to each other and the UK-SPEC
- To have experienced an activity through which they have begun to engage in a programme design process
- To be able to advise course and programme teams on the essential characteristics of a programme design that meets the output requirements of the UK-SPEC.

## **WORKSHOP: STRUCTURE**

The Workshop will be structured as follows:

### **Introduction (10 minutes):**

Participants will be provided with a brief introduction outlining the issues involved in designing programmes/courses on the basis of learning outcomes. The importance of aligning programme outcomes to the UK-SPEC, and developing a coherent alignment between assessment and outcomes at module and programme level will be stressed.

### **Group Activity (60 minutes):**

The main part of the Workshop will be set aside for a group activity. Participants will be divided into groups and tasked with:

- Designing (in outline format) a set of programme learning outcomes that meets the UK-SPEC
- Developing (in outline format) module learning outcomes for a module that contributes to the programme learning outcomes identified

- Creating (in outline format) an assignment with assessment criteria for assessing some of the module learning outcomes identified

**Plenary / Feedback (20 minutes)**

Each group will be asked to share the outcomes of their deliberations. Participants will be able to discuss the issues raised, their successes and challenges encountered. The workshop facilitators will seek to draw from this discussion key lessons for the participants to reflect upon with regard to their own practice of course/programme design.

**Note:** the Workshop will be jointly facilitated by the authors.

**References:**

Engineering Council <sup>UK</sup> (2004) UK Standard for Professional Engineering Competence: The Accreditation of Higher Education Programmes. London.  
Engineering Council <sup>UK</sup>  
Higher Education Academy Engineering Subject Centre (2005) Engineering Subject Centre Guide: Assessment of Learning Outcomes. Loughborough. Engineering Subject Centre  
Quality Assurance Agency (2006) Subject Benchmark Statement: Engineering. Gloucester. Quality Assurance Agency for Higher Education.