

A Hands-on Project-based Mechanical Engineering Design Module Focusing on Sustainability

What did/do you do?

The School of Mechanical and Systems Engineering (MSE) changed the Stage 2 Design module to a Design and Manufacturing module, and completed the transition from a paper-based design exercise to a group exercise which required students to design, build and test a wind turbine within a £100 budget.

Who is involved?

Thomas Joyce, Iain Evans, William Pallan & Clare Hopkins were the staff involved. Students were Undergraduate (Stage 2)

How do you do it?

Teaching for the module took place over two terms and the module represented 20 credits of a total of 120 credits for the year. Four hours per week of contact time were allocated, broken down into a one-hour lecture and a three-hour slot where the students worked in groups. At this time group/team working was not standard practice for the programme. The assessment (and percentage marks) for academic year 2007–08 onwards consisted of a group essay related to sustainable development (5%), an interim report (33%), seven updates within which students were encouraged to reflect upon how their project learning linked to UK-SPEC requirements (26%) and a Final Report and Logbook assessment (36%).

Why do you do it?

The decision to introduce the module was based on the understanding that students learn most effectively when they have opportunities for experiential, generative learning within groups and that group working represents a preparation for roles within the engineering profession.

(Continued on page 2)

Teaching and Learning Case Study

2014/15

Tom Joyce
Mechanical & Systems Engineering
(Bioengineering)

Coherent Curriculum themes:

- Student engagement

Other keywords:

Project-based learning, Hands-on-learning, Sustainability, Engineering design, Groupwork, Student engagement

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(Continued from page 1)

Does it work?

The experience of working in teams and under pressure whilst managing a budget developed students' independence and resourcefulness and enhanced their sense of freedom and creativity. They valued the experience of simultaneously being allowed this high degree of freedom whilst receiving support from lecturers. It seemed that the freedom of the learning environment which fostered group and individual creativity, coupled with the opportunity to acquire professional skills, had more power to enhance student commitment than their perception of a heavy workload had to discourage them.

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