

## **Design, build, test, float, fly and race – the School of Engineering Sciences Induction Week**

Study author: Liz Willis, Academic Co-ordinator, Engineering Subject Centre

Tutor in study: Kenji Takeda, School of Engineering Sciences, University of Southampton

Subject area: Induction Week

Study completed: March 2006 (Induction week observation October 2006, Student focus groups and tutor interviews completed in March 2006).

This case study has been developed from data gathered through a demonstration of the teaching and learning materials available, interviews with the tutor and a student focus group.

### **Background**

In order to provide a focus for students within induction week, the School of Engineering Sciences introduced a group-based, hands-on design, build and test activity for all first year students.

Activities included aerospace students building a balsa wood glider, mechanical engineering students building radio-controlled race cars, and students studying ship science building electric speedboats. Students also attended workshops on study skills, information handling and library resources and went on field trips, for example, to see the Solent Sky aviation museum.

The test activities have a competitive element and, following a poster presentation session at the end of the week, prizes for each subjects winning team are awarded by representatives from the Royal Aeronautical Engineering Society, the Institution of Mechanical Engineers and the Royal Institution of Naval Architects.

### **Reasons for introducing this teaching method**

The School had an expansion of student numbers and consolidated a lot of first year modules to be taught commonly across all programmes. *“Previously we had quite coherent, close-knit groups in each discipline, and we moved towards some larger first year class sizes.”* The School also wanted to improve the retention rate of students through the first year. The problem-based team approach meant that many aims could be achieved, both academically and socially, catering to the differing learning styles of students. In providing this opportunity early on, it was hoped that students would be able to adapt to the university learning environment and discover, by working with others, their strengths and weaknesses and how creative learning can be developed. The DBTFFR provided a framework to allow students to preview what they would be learning in their time at university and, in particular, provide context and motivation.

At the same time the tutor was studying for his Postgraduate Certificate in Academic Practice and received an Educational Enhancement Award to co-ordinate a new induction programme across the whole School.

### **Students’ perspective**

The students found *“team building and meeting people”* the most valuable aspect of the induction week. *“You get to know people, because you’re working in groups rather than sat in lectures.”* It gave those not familiar with the discipline a chance to get into *“the right frame of mind for the course”*. *“It gave you motivation because the start of the course is mainly maths and physics and not a lot of engineering, so it actually shows you where the course is going and gives you some encouragement to get on with the basics.”* Students were able to reflect on their first year and relate back to lessons learnt in induction week. *“We could do the same thing again essentially, but more scientifically, which would show you how much you’ve come on.”*

The students had been able to see early on in the course the benefits of working as part of a

team and felt this had improved their work in subsequent group projects. Benefits highlighted included: improved confidence (*"I was less afraid of talking to people"*), *"leadership"*, inspiration (*"if someone's particularly good you'll try and aspire to their level"*) and learning from peers (*"if you're working with someone and they're especially good at something it's going to rub off on you"*).

### **Issues**

Devising activities which *"would work within the timescale"* was one of the initial challenges. Those involved with developing the design and build tasks found it useful to trial them at the Headstart<sup>1</sup> summer school and refine the rules as needed. Timetabling was also an issue as *"we took quite a bold step to essentially scrap all of the lectures in the first week of term"* and this had to be agreed with all of the academic staff. Most were happy to accommodate this because they were also *"keen to try and improve the contact they had with students early on and could see the long term benefits"*. However this was not possible for all modules such as mathematics, which is a Faculty-wide self-paced course, and a Materials e-learning course. Both needed introductory slots. Students had to be allocated time slots to use the workshop facilities and this had to be clearly outlined during the introductory session to make sure all the teams planned accordingly and weren't disadvantaged.

### **Benefits**

The tutor had found it difficult to measure the long term impact of induction week but it had been noted that there was a *"difference"* in the students. Course tutors were noticing that students were more proactive and reactive in all first year classes, including lectures, and the student retention rate has been improved. A 50% reduction in drop-out rate over semester one was noted in the first year of implementation. *"I saw more of my tutees than usual, so now they are more inclined to approach me and chat in my office"*.

### **Reflections**

The students clearly enjoyed the design, build and test activities and the final racing and flying competitions were lively and exciting events. The poster sessions provided a good opportunity for students to explain their design decisions and the visitors from the professional institutions were particularly impressed by the students and their work. The other activities from induction week were given a more mixed response. For example, the study skills lecture was the least popular, especially with students who felt confident with their own learning. However the organisers of the lecture felt that this would be a valuable activity for all students and some had found it very useful. The Library sessions were considered useful by the students for their studies and at an appropriate time in the course. The more detailed session was previously run at the end of the second year and moved to induction week following feedback from students.

The induction week is supported by three professional institutions and representatives from the Royal Aeronautical Engineering Society, the Institution of Mechanical Engineers and the Royal Institution of Naval Architects all participate in the final day of induction week, giving a presentation to the students on their organisation. This is a valuable opportunity to explain the important role that professional institutions play in modern engineering. The representatives judge the final racing and flying competitions and assess the student poster presentations.

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<sup>1</sup> Headstart is part of the Royal Academy of Engineering's Best programme, and is administered by The Engineering Development Trust. The Courses offer pupils an opportunity to stay at the engineering department of a university to find out what it is like to study for a degree in science and engineering.