

A Student's Perspective on The Teaching Contract Scheme in the Wolfson School of Mechanical and Manufacturing Engineering

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This case study gives the views of a second year student who participated in the Teaching Contract Industry Based Project (IBP). Links to CS2 and CS22.

Reasons for engagement

The Industry Based Project is a compulsory module run in both the second year of the Mechanical Engineering degree programme and fourth masters year at Wolfson School of Mechanical and Manufacturing Engineering. The programme has been long standing in the department providing, for some second year students, the first contact with an engineering company in a client based manner.

The benefits for students, although not always immediately recognised or appreciated, include primarily a vital insight into the workings of a company and what it is like to be given a problem that needs a solution or a series of recommendations. For companies, non critical problems are given thought which otherwise would not have received any resources in the immediate future. The school benefits from building a reputation for producing high calibre students.

The engagement

IBP is the one of the few modules which continues through both semesters and

includes a short series of lectures aimed at prompting certain phases in the design process. In addition, a minimum of one group meeting is held each week. Students are divided equally between the companies by a team leader selected on first year peer assessment results. The remainder of the students allocate themselves to a team leader until that team is full. The partially random selection process brings students out of their comfort zones; in many cases they must work with peers they don't know particularly well, to simulate what happens in industry.

The groups of 4-5 then visit the company and are presented with a number of problems. The idea of the visit is to give the groups enough information about the problems to be able to select one which they feel they would like to take on. In the second year there are usually 2 problems between 4 groups, where two groups will work on the same project brief. Having two groups on the same problem is interesting for the company to see the diversity in how the students not only approach the problem, but what solutions they come up with.

The projects are often design based and most students have little experience of the design process so there are a number of supporting lectures. The lectures range from an overview of the design process to specification writing and the format of a technical report, however, greater independence means that students learn to find things out for themselves.

A small number of MEng finalists are allocated to selected groups and the results of the groups are partly dependent on the dedication of the final year student. If a group has a dedicated and willing finalist, the experience and knowledge to the group is great. A student who can share their personal experiences is always an advantage when approaching a problem.

The first deadline is a progress visit from the company; there are 2 progress visits during the course of the year as well as a third final presentation visit. These visits are ideal opportunities to ask questions and request information as well as show the company the progress that has been made. Areas of concern are easily highlighted to the company who can then point the group in the right direction. It is not uncommon for a company to review what the group has done and alter the original brief. The group's focus can either shift onto a previous idea or they may have to divert their attention to something they had not considered in detail. Students learn that one aspect of working in industry is balancing pleasing the client with constraints of time, resources and expertise.

At the end of the first semester a feasibility study to assess the progress of the project is completed, with a final report submitted at the end of the year. The reports accurately simulate the style and formats which are used in industry and students face the challenge of writing as a professional engineer.

IBP ends, after 8 months of work, with an oral presentation. This is presented to representatives from the company, the

other groups, the mentors and the lecturers. It is up to the groups to ensure that each member is confident enough to present one aspect of the project. The presentation is followed by a series of questions, which can come from anyone present, and tests the solutions presented as well as the level of detail. Presentation and communication skills are a crucial part of becoming an effective engineer and this is often the first experience which students have to present in front of industry professionals. The presentation contributes to a large percentage of the marks for the overall assessment.

Issues

As with all projects, the IBP has flaws in its execution. As mentioned previously, some groups experience issues with lecturers being very busy and mentors who don't provide much assistance which frustrates the students who experience it.

There are always going to be issues working with people you don't know or discover you don't get along with, however in most cases this can be solved with a "let's just get through this" type attitude. There are groups who suffer greatly because of a lack of communication between the members, or where someone doesn't pull their weight. For the latter problem peer-to-peer assessments are a good chance to voice these concerns and to ensure team members receive their marks fairly.

The largest test of this project is time management, and with so many other group projects going on simultaneously, finding the time to hold group meetings presents a challenge in itself. It is good that one afternoon is set aside solely for IBP but with a project of this scale, one weekly meeting is often insufficient. With deadlines looming, students often have to find the time to meet up, working long hours is not so much of an issue, but more a lesson that things should never be left to the last minute.

Benefits

It should be widely understood that students, especially those in second year, will not appreciate the lessons and skills acquired from this exercise, as only the pain to learn them is remembered. It is only when students work for real, in a similar situation, that they realise that when the lecturer talked about a specific way to format a report it was relevant to industry standards and a client not releasing information is not that uncommon. In many ways, IBP gives students the taste of working in industry but in a learning environment. The IBP prepares students, most likely unawares, of working in the real world.

The companies involved with the second year projects gain two perspectives and solutions at the end of the year. Sometimes there is only one practical solution, but in many cases students have an innate sense of seeing things in a new light, producing two very different solutions. The biggest benefit for companies is getting solutions for problems they need solving but haven't got the resources to do so immediately.

Students can be presented with problems they have no expertise in so they have to explore new subject areas. Projects like this are challenging for students to gain the right level of knowledge required and add a larger breadth to the students' University careers and learning experience. It gives students the chance to research and learn about areas which are not covered in the course. This experience is unique to modules such as the IBP.

Unintended outcomes

Some companies involved with the IBP look at it as a way for recruiting students. However there are cases where the students have not had a positive experience with the company and decide that it is not a company with whom they would like to work. It is often just as useful for students to know areas they don't want to work in as much as those they do.

Student perspective

It is a highly demanding module in which students have to apply skills which are used in industry. Furthermore, it is important that students are exposed to industry and given real world challenges. It isn't surprising that there is positive feedback for the programme once the student realises the value; often only after an interview for a graduate job.

Reflections

The IBP is a good indication of real engineering problems and the diversity within them. There are a series of experiences that students should be exposed to before working in industry and the IBP is an effective way of delivering them. The majority of students will take these experiences and build upon them to become more effective employees. For those with negative experiences, they will hopefully be able to learn from the mistakes that were made.

Context

Emily Cheung is an undergraduate Mechanical Engineering student, studying for a Masters in Engineering with a Diploma in Industrial Studies. She joined Wolfson School of Mechanical and Manufacturing Engineering in October 2006 and in her second year chaired the department's undergraduate committee, representing the students of the school at Loughborough Students' Union. She is currently completing her year in industry at Atkins, Defence Systems.

