

Engineering Enterprise

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Abstract

This case study describes how an optional Level 3 course module (also available to MSc students in Engineering) was developed, in order to cultivate and encourage the expression of entrepreneurial skills for setting-up and running Small or Medium Technology based business as an alternative option for graduates' employment.

SMEs constitute by far the most important sources of employment and wealth creation and the importance of SMEs is supported by UK and EU statistics. The module highlights the merits of working in an SME environment and students are taken through the process of establishing whether they possess the characteristics of successful business creators.

Background/key features of the module

The module was introduced in 1997/8 as an option for final year undergraduate students and MSc students of all engineering disciplines. It runs once a year during the second semester for 13 weeks with contact time of 3 hours per week.

The student population has varied between 10-20 students per year and a good proportion are part-time students with work experience. Many of these have been involved in small companies or were planning to set-up their own businesses. During 2003-4, in addition to the scheduled timetabled contact time, the students were encouraged to join other students in our Business School Entrepreneurial Unit and attended 5 evening sessions where guest speakers talked about their experience with start-ups. This is now part of the programme.

Why run an entrepreneurship module/programme of this kind?

It is widely acknowledged that the development of entrepreneurial confidence combined with business calculated judgement and management skills is of great importance in the career development of engineers.

The majority of engineers find employment in SMEs and indeed many of them soon become involved in setting up and running small / medium size companies as sole proprietors or in partnership with others. The module is therefore designed to provide engineering students with the essential knowledge and skills required for successful engineering start-ups.

The broad aims of the module are:

- To introduce all the topics relevant to the setting up and running of small engineering companies in sequence and in support of the final preparation of a successful business plan.
- To cultivate and encourage entrepreneurship and develop students' confidence in expressing innovative business proposals.
- To help students develop knowledge of the market mechanisms and their parameters; and, forces of the real business world with particular emphasis on the culture and chemistry of small businesses.

- To offer students a good overview of self-employment as an alternative career path and further enable them to evaluate whether this alternative is a suitable option for them.

What skills and abilities are enhanced and developed?

An extensive range of entrepreneurial skills and abilities are enhanced and developed by introducing the students to a series of relevant topics which have a particular emphasis on the knowledge and skills required for the development and management of a successful business.

What skills and attributes do students need to embark upon the module?

There are no pre-requisites for this module.

Links with outside agencies and employers

Outside speakers are invited to share their experiences of start ups and local employers including bankers and those from the venture capital community play a part in the assessment of student presentations.

How is the module assessed?

The module is assessed on a 50/50 basis (course-work and exam). Course work revolves around 3 case studies plus the final presentation of 'the students' own company' business plan. This is assessed by experts from the banking and venture capital community, - an occasion for students to present their individual business plans in order to raise funding for their proposed business.

Issues and challenges

The foremost challenge is to select topics that will provide the immediate basic tools for entrepreneurial start-ups and keep up with environmental changes. The second but equally difficult challenge is to satisfy students' expectations. This is an optional module and many students select it on the assumption that they will learn something that will help them make money quickly. It is therefore quite difficult (and often amusing) to hold them back explaining that 'money doesn't grow on trees' although well thought through business proposals, are worth pursuing to the limit. The value of thorough planning, even if one is using one's own risk money is often a difficult message to put across, as students tend to associate hard preparation work with external rewards (funding from venture capitalists or banks). It is equally hard to convince them that as long as a business comfortably returns in excess of the cost of funding, borrowing is a better option than using one's own capital.

External judges often take students to their limits particularly when they do not fully understand the 'engineering idea'. This is a general problem not just in class but in the market as a whole, since innovative products are generally challenged by the financial community and often classified as risky. Nevertheless, the students are encouraged to reflect that in a knowledge society, technology can provide the kind of business opportunities sought and that early difficulties and challenges can be well rewarded in due course.

Evidence of enhanced learning and teaching

- The commitment, interest and effort of students while attending the course.
- Student feedback comments at the year-end course evaluation questionnaire over a number of years.
- Contact with previous students who have set-up and successfully run their own business.
- The positive comments received from the external industry 'judges' of the students.

- Students' 'Own company business plans', presentations and reports.
- The support from employers and local businesses.

How can other academics benefit from this experience?

The key element is to encourage the students from the start, to identify an engineering business they are really interested in setting-up, and help them develop a business plan. The target of ultimately presenting their case to bankers for funding works well, but choose external judges sympathetic to technology based businesses.

If students have had no previous management / business subject exposure, some topics such as basic accounts and cash-flows might take some time to deliver. Examples of success stories are always encouraging. Furthermore, if students are to attend lectures by successful entrepreneurs (highly recommended), make sure their cases are relevant to engineering businesses otherwise they might be side-tracked.

It is very useful for the lecturer to have some exposure to an engineering business and/or contacts with the venture capital community and fund raising processes in a commercial context. This will generate ideas and provide examples of good and (possibly bad) practice.

Sharing experience with colleagues is also extremely important and I am always receptive to fruitful discussion and exchange of ideas.

Reflections and future developments

I have been privileged having spent 8 years in corporate banking and subsequently 12 years in setting-up and running 3 companies. However this can be problematic as I tend to judge and compare the way students wish to conduct business with the way I did.

Shadowing successful entrepreneurs might be a better way forward, if such people can be made available to mentor students. It might be useful if 'work placements' can be organised in entrepreneurially driven SMEs, although this would be difficult for final year students. However, bringing the module forward to year 2 to accommodate work placements would exclude postgraduates whose participation and contribution raises the level.

Part-time students with work experience really make a difference in class and it might be an idea if the module (as a stand-alone) were to be made open to members of the local business community.