Commercial projects for final year Bioscience students

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Background and rationale

Many students who graduate in the life sciences do not follow a laboratory based career, either through choice or lack of opportunity, and the classical laboratory research based final year honours project may not be the best preparation for them for their future employment. It could also be argued that with increasing budgetary/ space/supervisory constraints on 'wet' projects, many departments would benefit not only themselves, but their students, by providing other types of Honours projects.

There have been some initiatives to offer so called 'dry' projects, usually involving some data acquisition, data handling or questionnaire studies which suit some students and degree disciplines very well. Another alternative pioneered at the University of Glasgow in the last two years has been the provision of 'commercial projects'. These are available to all final year students from the 20 different Honours degrees in Biosciences, offered by the Faculty of Biological and Life Sciences. They carry the same credit and assessment weighting as the traditional wet/dry projects and are completed in the same timescale, being worth approximately 12% of the final degree mark and taking 2 days a week over a 10 week period.

How to do it

Commercial projects are those in which students undertake a piece of work which is suggested by, and done for, a local bioscience company. They usually involve some form of market research for a new product, or a new market for an existing product, research on potential competitors, or the impact of new regulations on manufacture/marketing. For example, one project researched the market for two new herbal medicines; another resulted in the formation of a database on companies involved in biological defence; and another student prepared a dossier for the registration of an existing product under new EU regulations.

Each student has a company sponsor who guides the research, and provides a detailed plan of what is required by the company. They usually meet the student at the beginning and end of the project, and maintain contact in between by phone/Email. The student does most of the work in the University but can visit the company as and when required. In addition, the student has an academic supervisor who is responsible for all the assessment of the project and for validating the underlying science. The project report is written in two parts:

- A standard Honours project report, in the usual format of Introduction, Methods, Results, Discussion, Conclusion and Bibliography (which is assessed by the academic staff supervisor)
- An accompanying technical document which becomes the property of the company sponsor.

The student undergoes a viva by academic staff and the company mentor is asked to provide a written report on the performance of the student which is reflected in the final mark awarded.

Advice on using this approach

i) Ensure the projects on offer represent the appropriate range of biological disciplines

The commercial project scheme has benefitted enormously from the support of a full time Work Learning Officer (employed as part of the SHEFC funded Aiming University Learning @ Work programme, www.gla.ac.uk/services/careers/academicstaff/aulw/), who has greatly expanded the number and range of companies willing to take part in the scheme, such that the projects on offer are attractive to students. This has been achieved by attending networking events, liaising with Government Enterprise initiatives and directly contacting local companies.

ii) Prepare students appropriately with an introduction to business.

It would be unrealistic to send bioscience students with no training in business techniques out to companies and expect them to do a good job for them. Hence all students who opt for a commercial project take a 2 week intensive Level 4 course, called Business and Biosciences, prior to their project. The course runs for 5 days a week, for 2 weeks, from 9-5 and is held in week 0 and 1 of Term 1.

The course provides the students with the necessary knowledge and business skills to undertake a piece of useful work for a company. The course covers business planning, finance, marketing, presentation and culminates in the students (in teams) preparing and presenting a business plan (Dragon's Den style) to a panel of would-be investors (the academic staff involved in the course and the company sponsors). This is the first meeting of the company sponsors with their project student. The course is very interactive, with a mix of theory and practice and is taught by a mixture of University staff involved in the Enterprise schemes, and from the Department of Business, plus outside experts — a local businessman and other experts in the field of marketing. Scottish Enterprise offices in Glasgow city centre act as host for 2 days and the course also involves a visit to a bioscience company.

Although the course is a requirement for commercial project students, it is also open to all other Level 4 students as one of their option choices, and has proved popular. When asked why they chose it, students typically respond along the lines of "sounded interesting and relevant to what they hoped to do after graduation" to "wanting something different on their CV". The student feedback on the course has been most gratifying. From initial panic at being "outside their comfort zone", and being really pushed with tight deadlines such that they worked together all day and arranged evening sessions as well, they all reported a great sense of achievement and said that the experience had really boosted their confidence.

External company sponsors who attended the final presentations were also most impressed, and the students really valued their involvement and their opinion. The students preparing for their commercial projects said that the experience gave them a real feel for how business is conducted in a commercial setting.

Troubleshooting

As highlighted earlier, the recruitment of bioscience companies willing to take part in the scheme was very time consuming and was the major hurdle in the beginning. It is doubtful whether the academics involved could have found the time to do this. However, once a database of potential companies was established, the further workload was much reduced. The scheme has a high profile via the University website, and hopefully word will spread amongst the bioscience companies in the area and more will be encouraged to become involved.

The recruitment of the students proved difficult at first, as each degree programme matched students to projects in slightly different ways and at different times in the session, so that a coordinated response was not always achieved. The students are most persuaded to try this type of project by peer recommendation, and we have organised for past students to talk to prospective fourth year students about their experience. This is very useful as the students so far have been positively evangelical about the course/projects. This was exemplified at their willingness to become involved in research undertaken as part of the AUL@Work Programme.

Another possible drawback to the commercial projects is the requirement for the students to take the Business and Bioscience course as one of their four Level 4 options. Some degree programmes are more prescriptive as to which options the students can take, and some Level 4 Course heads would prefer their students to take 4 courses in their subject discipline. However, the students on the course so far have more or less made the decision to move out of 'pure science' and it could be argued that to give them this extra breadth to their degree course is the most appropriate choice for them.

Does it work?

The commercial project scheme and the Business and Bioscience course has benefitted because the students participating are to some extent self-selecting — very motivated, they have often taken part in student enterprise schemes previously, and they have actively chosen to use and apply their scientific background in a commercial setting. They see the course and the chance to work for a company as something which will definitely help them in their future careers. This year, one of the students undertaking a project has been offered employment by her sponsoring company, after just 6 weeks working for them.

The companies also benefit by having a piece of work done for them at no cost — a 'free pair of hands', with the added benefit of fostering links with their local University. Most of the companies involved are small, and the projects they offer are work which they need done but are often constrained from completing by lack of resources. So the association is mutually beneficial.

One company that had been involved in the commercial project scheme from the very beginning was Bioforce (UK) Ltd, a biotechnology company employing 88 people and producing and selling herbal medicines and related products to health food shops and other outlets throughout the UK. This is the company that is visited during the course and within the visit the students receive a session on Good Laboratory and Manufacturing Practice from company staff. The Project Manager, Dr Mark Cole, in an interview about the scheme in the Spring 2007 edition of Nexxus News, gave a sponsoring company perspective:

- "We suggest a project, meet with the student for a preliminary briefing, and then the student works independently for about 12 weeks, with occasional phone or email contact. The student then produces a fully referenced report of about 10,000 words. Apart from the time spent interacting with the student, there is no cost to us involved. These reports are invaluable tools in deciding on product development — we don't have the resources for our own staff to do these in depth studies and the students' contributions represent a real added value to the company."

One of the students involved in the scheme, Kate Macfarlane (Hons Biochemistry 2001-2005) gave her reflections:

- "My first degree was Biochemistry but by the end of third year, I knew I didn't want a laboratory based career but still wanted to use my scientific knowledge. So I leaped at the chance to do a commercial project for Bioforce. My project involved researching the market potential in the UK for extracts from the Neem tree as potential insecticides. I produced a report which formed the basis of the company's dossier for registration of a neem pesticide in this country. I felt that I had made a major commercial contribution and that working on this project has given me the experience and confidence to plan my future career."

Commercial projects and an associated training course (as either part of the formal course structure or in addition) could easily be adapted to suit other universities' degree programmes. The fact they are both credit and assessment bearing means that students take them seriously, and they are not seen as an added extra but an integral part of their degree programme.

Further developments

We are constantly refining the 'Business and Bioscience' course to make it Enquiry Based Learning-led (and have a student doing the research on this as his commercial project for 2007-08; for details see www.bioscience.heacademy.ac.uk/ftp/events/scothe07/EBL.pdf).

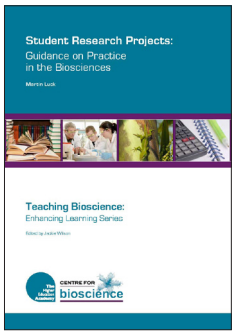
We have also expanded the range of outside experts involved. The number of projects on offer has increased and we are endeavouring to make them attractive to students from all bioscience disciplines. In the future, we need more education, of both staff and students, as to the benefits of commercial projects as part of the overall thrust to embed work related learning into the curriculum and enhance students' employability.

As the Universities Scotland (2003) Getting Ready for Work document states: "What graduates need is to be employable; what employers need are employable graduates … An understanding of the world of work and awareness of business (public as well as private) is desirable".

Reference

Universities Scotland (2003) Getting Ready for Work: Employability and Higher Education, p1

Additional materials



This case study was written to accompany the Teaching Bioscience: Enhancing Learning guide entitled *Student Research Projects: Guidance on Practice in the Biosciences*, written by Martin Luck and published by the Centre for Bioscience. The associated website (www.bioscience.heacademy.ac.uk/resources/TeachingGuides/) contains a downloadable version of this case study

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