

HUBS 2009 Spring Meeting: 'Challenges to maintaining standards'
5 – 6 May 2009, Weetwood Hall, Leeds

Session One: Key Scientific Skills I

Speakers: Sarah Jones (Association of the British Pharmaceutical Industry)
"An industry perspective on skills for biomedical research" [[Presentation](#)]

Mike Blackburn (University of Sheffield)

Jeremy Craven (University of Sheffield)

"Does Chemistry have a role in modern Biology?" [[Presentation 1](#)] [[Presentation 2](#)]

Group One feedback:

It is important to recognise that university degrees are not all about practical work and an emphasis should be placed on developing a broad base of practical skills. The development of practical skills could be enhanced by increasing the number of courses offering sandwich placements and four year degree courses.

A structure suggested was a structured 1st year practical programme, followed by greater complexity and independence in the second year and a project in the third. This structure was seen to have the objective of giving practical skills and linking them to data interpretation. The idea of a final year project was given full support by the group.

It was felt that the current A/AS level curriculum should be further modified to support biology. Salter's Chemistry A-level has been seen to be contextualised and therefore it should be possible to modify the biology curriculum. An increased level of dialogue between biology and chemistry communities was seen to be crucial.

Group Two feedback:

The diversity of the scientific sector e.g. ecology to biochemistry means that different practical skills are needed for each discipline. The barriers to increasing practical skills were seen to be cost, in both capital and staff terms. However, it was noted that in planning practical skills sessions, using lab time sensibly e.g. only teaching skills that require a student to be in a lab, greatly increases effectiveness.

As many students who undertake science degrees do not remain in the sector, the question of whether current degree programmes prepare students for careers in other areas was raised. Is it correct to assume that those who are going to stay in research are more likely to stay on for four years or undertake sandwich courses?

Modular courses were seen to allow students to potentially dodge harder subjects, making some modules compulsory was seen as a solution.

Although perhaps beneficial, it was thought that a compulsory chemistry A-Level for biology undergraduate courses would negatively impact on uptake. Many institutions teach an effective 'Chemistry for Biologists' course in year one.

As an aside, it was noted that everything that had been said about Chemistry A-Level could be said about Maths A-level.

Session One (cont): Key Scientific Skills II

Speakers: David Rice (University of Sheffield)

“The impact of changes in Maths teaching on new undergraduates” [[Presentation](#)]

Peter Mayhew (University of York)

“Challenges in the teaching of ecological field-skills”

Group One feedback:

Sound mathematical knowledge on degree entry was seen to be more vital than chemistry knowledge and the perceived decline in quality of maths teachers was only worsening this situation. Tests on arrival to institution were seen to be beneficial in allocating the provision of remedial support where necessary. An audit of the types of maths support offered e.g. test on arrival, remedial work, student workbooks, tutorial support and drop in session could be helpful.

It is thought that if the new diploma is indeed developing a ‘maths for science’ element HUBS may be able to add value to this development. HUBS should endeavour to learn more about the GCSE/A1/A2 syllabuses and the idea of a Society of Biology/Royal Society of Chemistry/Institute of Physics working group was suggested.

Funding is seen to be a major barrier for some students, although hardship funds and part time courses may be available. It is thought that the issues relating to equality and diversity within the student population will become increasingly important.

Group Two feedback:

The discussion focused on units of resource and the question of ‘have standards slipped?’ If they have slipped, then what will be the issue and how can the Government be engaged on this issue. The need for indicators that UKPLC is deteriorating is key.

Field trips are seen to be very beneficial, offering students a chance to become immersed in their subject. Although far off field trips are often targeted for cost cutting, in reality it is not always cheaper to stay in the UK.

In addressing the issue of a deterioration in maths skill, embedding remedial maths into the curriculum was seen to be the best way to address this.

Session Two: Final Year Research Projects and Fieldwork

Speakers: Richard Reece (University of Manchester)

“ Practical Work”

Robert Freedman (University of Warwick)

“Resource and comparability issues in planning, supervising and assessing final year projects: can they all be equally challenging?” [[Presentation](#)]

Group One feedback:

Most agreed that the skills and attributes developed through carrying out final year projects were an essential component of an honours degree. Important skills were the ability to work independently, organizational skills, being able to draw conclusions from data.

Whether the traditional research project was essential for ALL students was discussed bearing in mind that only a minority of students will go on to bench careers. Loss of the above skills would devalue the degree. However in reality are all skills really being developed?

Library projects were often not monitored well enough – formal weekly meetings may help here.

Constraints on delivering traditional projects were seen to be human resources and consumables. Could the essential skills be developed in a different way? i.e. could we decouple the lab skills from the generic elements of a project? Can some of the skills be delivered using set practicals? There was some support for this idea.

Other alternative ways of providing attributes were discussed.

- The 1 year MRes was one option but it was considered that it was too narrow a group ie only a few students would follow this route
- An extended integrated MSci was discussed where the better students are selected to go on to lab-based projects
- External placements, although these may require as much effort as a traditional project.

Conclusion: we need to continue to offer opportunities to develop skills and attributes. The traditional research project was considered one way of doing this but other ways were also valid.

Group Two feedback:

In response to Professor Richard Reece (University of Manchester) “Practical and research skills in life sciences – costs and numbers vs quality

The group considered:

- Problems associated with the delivery of practical teaching to large classes considering issues related to space, cost, contact with students, integration with lectures.
- Superlabs as developed by London Metropolitan University providing all in one lab space “owned” by students. Generally idea received low support because of infrastructure costs, inflexibility, high technical demands
- Disconnecting practicals, taught as stand alone modules from lecture modules. It was generally thought this would provide:
 - Coherent well-structured practicals in a module that would build one practical to next, providing continuity and the ability to provide worthwhile feedback to students.
 - Efficiency gains through streamlining and simplification of procedures.
 - Opportunities for clear auditing of delivery and success of practicals.
 - But it was also thought that it would make practicals less flexible.

In response to Professor Robert Freedman (University of Warwick) “Resource and comparability issues in planning, supervising and assessing final year projects”

- The group agreed that lab-based practical projects were extremely valuable to students
- Alternatives including literature-based projects need good mechanisms to ensure delivery of work with clearly defined hypotheses and objectives, and that could demonstrate synthesis of materials. Clear process is as important to staff marking the projects as it is to students. Warning was given that this type of project can reduce the options available to students wishing to do post graduate degrees where a premium is given to lab-based projects
- Attention was given to MRES (i.e. 4 year undergraduate programmes). Many considered this to be a highly desirable direction to move in and that this provision should be expanded. The fourth year provides opportunities for valuable training to students that could do worthwhile, meaningful projects. Funding could potentially be achieved by obtaining more FTEs or exchanging 3 year degree FTEs for fewer 4 year FTEs

Session Three: Assessment and Feedback, Roles of External Examiners, Maintaining Academic Excellence

Speakers: John Coggins (University of Glasgow)

“Sustaining and enhancing excellence in science teaching” [[Presentation](#)]

Simon van Heyningen (University of Edinburgh)

“Assessment and feedback” [[Presentation](#)]

Group One feedback:

Assessment

There was general agreement that we overassess our students and that the balance of assessment was too much towards summative assessment. Points discussed included:

- Several assessment points can compensate for a missing assessment element
- Different types of assessment can assess different learning outcomes and skills

The effect of credit framework restructuring was in some cases to increase assessment, whereas there was an opportunity in other cases to reduce assessment. There was a perceived need to balance assessment modes both within modules and between modules in a given year and there was some support for integrative assessment or synoptic assessment if this could be used to replace other elements of assessment

Teaching Science in Schools:

There was general support for Universities to have more influence in the design of the A-level and Higher curricula. There was a need for greater interaction between Universities (particularly 1st Year teachers) and schools, at all levels. Professional societies can play a role in facilitating this interaction and it was hoped that the Society of Biology would contribute towards this.

Group Two feedback:

In response to Professor John Coggins (University of Glasgow) "Sustaining and enhancing excellence in science teaching"

- It was generally considered that more schools engagement was important and worthwhile. This is already done through widening participation schemes and recruitment, but more is needed to fulfil our wider outreach responsibilities.
- There was a realisation that the sector has the resources in the form of:
 - Dedicated staff that may or may not get credit that do these jobs.
 - Research council grant holders who will in the future be contractually obliged to do outreach activities.
 - Ph.D. students who can have some outreach activity embedded into their training profile.
 - Use of Learning Departments who can organise events.
- Activity can be (1) Schools (teachers and/or pupils) to Universities, (2) Universities to Schools, (3) School Governor positions.
- A most important future direction should be to become intimately involved in the direction and content of School curricula.

In response to Professor Simon van Heyningen (University of Edinburgh) "Can we make assessment helpful to students, while maintaining standards"

- The group agreed that there was too much assessment of students and too much of that was summative and not enough formative assessment. There is a need for more quality and less quantity.
- This can be achieved through module merger, which can reduce load while maintaining contact.
- Honesty is important into what students should expect and when, i.e. transparency.
- More synoptic assessment means are needed, most participants had this form of assessment in their final year, but it was less common in lower years.

Notes by

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