4 | 1st Year Bioscience Lab Classes

It is recognised there is a shortage of bioscience graduates with laboratory skills and aptitudes. It was therefore thought worthwhile to discover students' views on the laboratory work they undertook in year 1 of bioscience courses so that changes could be made which might improve the students' view of laboratory work and feed through to later years a student body more interested and involved in laboratory work. In conjunction with AstraZeneca and the British Pharmacological Society, the Centre for Bioscience has surveyed 1st year bioscience students about their views on laboratory classes they were undertaking. Returns from 695 students (70%) in 9 UK universities were obtained in February-April 2007. While this was a good response rate it must be borne in mind that an opinion expressed by say 40 students represents less than 5% of the returns.

Results

Most students preferred the laboratory classes they had experienced at school to those they were experiencing at university ('Very good explanations and demonstrations given. Much more help given. A lot more teaching around the subject before the practical and told exactly what to do and why.').

Although student views were varied, there was clear identification of the best features of university laboratory classes as:

- learning new skills and using new equipment;
- the opportunity for social interaction with students and teachers;
- the ability of practicals to illustrate material given in lectures;
- the acquisition of new knowledge through practical classes; and
- high interest value of practicals.

Students identified the worst features of university laboratory classes as the:

- length of practicals – 'too long';
- organisation – poor, 'always waiting about for stuff';
- write-ups – 'too time-consuming, too long';
- nature of practicals – tedious, boring, repetitive; and
- staff contribution – inappropriate and variable, 'staff were rude if you didn't understand something'.

Discussion

Overall the data raises concerns that for many students the experience of laboratory work in the first year is not good and there are some themes which suggest ways forward.

Effectiveness and consistency of staff. It is appropriate to ensure all staff teaching the practicals are competent, approachable, fully informed and able to teach, not just run the practical.

Socialisation. The importance students place on knowing students and teachers in their class and forming friendship networks should be recognised and enabled.

Attitudes. Students find 1st year practicals long, boring and tedious. While appreciating that teaching skills are important (and valued by students) there should be an additional explicit objective for 1st year practicals – enthusing and interesting the students in laboratory work by ensuring they experience the excitement of discovery.

Organisation in practicals. The students' emphasise 'waiting around' for one thing or another. In part this may be an issue of equipment shared between too many students.

Reliance on lab equipment. We need to address the heavy emphasis students place on equipment (complicated, advanced, better) and get across that equipment is not an end in itself. Repeatedly, students emphasised their interest in equipment, never what it enabled them to do.

Environment. The issue of students enjoying practicals at school because they felt more relaxed. This may come from the greater familiarity they have with the school environment. At the first practical, everything and everybody is new to students at university.

Transition. The magnitude of the transition which students are undergoing from school to university needs to be recognised. As one student said 'it felt like I'd been thrown in at the deep end and without a float'. We should consider starting in a very supported environment and allow students to make the necessary transitions over a set of laboratory classes during semester 1.

Diversity. We must recognise that 50% of students taking biosciences courses may take employment outside bioscience, let alone involving laboratory work, and courses at university need to provide a good and appropriate experience for all students.

Two interesting suggestions emerged which might be areas for development: 'students should be able to do a lab again until they are satisfied with it', 'it would be useful to have a take away example of a perfect experiment for revision purposes'

Finally, reporting some very positive comments made: 'on the whole I love them and find them really useful and always fun to do', 'brilliant lab classes with helpful tutors and great instructions. I've learned a lot and enjoyed so much. Thanks.'

Conclusions

While most students in the biosciences progress to careers not involving practical work, some will become involved in practical studies in education, research and industry. The early experience in university is likely to have profound effects on whether some students see practical science as an attractive and exciting career choice. The survey results suggest ways in which 1st year bioscience practical classes could be more engaging and stimulating.

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