Learning to teach – teaching to learn

Demonstrating in a practical class has shown a cohort of honours students that effectively communicating knowledge and instructions to students requires careful preparation, precise time management and a clear and inclusive manner and, whilst an enjoyable and rewarding experience, is not as easy a task as they had assumed from their experience as students in their undergraduate days. It has also shown that there are valuable opportunities for personal development for both teacher and learner in a practical class setting.

Teaching in practical classes has invariably been both a valuable and enjoyable experience for many postgraduate research students during their years at university and has provided them with both financial and educational rewards. In our department, the participation of postgraduate research students in practical classes has contributed significantly to the high profile and success of our department in undergraduate teaching, measured not by our scores in quality of teaching surveys, but also by high recruitment rates into our honours and other postgraduate courses. Honours students have not traditionally been included in this teaching experience as it was thought their time was better spent on their course and laboratory work to optimise their chances of receiving research awards.

This view was challenged by a proposal asking honours students to demonstrate in practical classes to students enrolled in a third year engineering subject. It was suggested that learning about the art and science of teaching would significantly enrich the honours students’ program by improving their basic communication skills and providing a setting to develop leadership and group management skills. The practical class work was simple in concept and design and required only a basic knowledge of microbiology, so the focus was not on content delivery but rather on the safe and efficient use of some simple microbiological techniques included in some simple experimental protocols.

The importance of sound preparation before expecting students to begin teaching was well understood. Before the practical classes commenced, the honours students were given 4 hours’ training, 2 hours on the theory and practice of teaching and 2 hours’ instruction and practice in carrying out the practical exercises that they were to teach. Subsequently each honours student was required to teach a group of eight engineering students for 2 sequential weeks, for a total of 4 hours’ practical work. They were also required to mark practical reports. After the laboratory teaching had been completed, a further 1-hour session served as a debrief session, an opportunity to work through the report marking guide provided and a discussion about the reflection they were required to write on the exercise. No marks were attached to this latter task; nevertheless it was completed thoughtfully by all students. Students were paid for participating in the exercise.

It was hoped that this exercise would have three main outcomes. The first would be an increased awareness of the importance of communicating clearly in a laboratory environment. The second would be an increased willingness by honours students to participate in practical teaching in subsequent years and so develop teaching skills as well as their research skills. The third desired outcome, for the engineering students, was an improved understanding of the material covered in their microbiology lectures. To determine if these outcomes had been achieved, honours students were surveyed both before and after their teaching and engineering students answered additional questions on their Quality of teaching surveys.

The first survey, taken before they commenced teaching, showed that the majority of the honours students were looking forward to the experience. Some students expressed concerns around...
not knowing what to expect and not being confident about the subject material they had to teach. Most students had found the workshop about demonstrating to be useful and believed it had given them confidence to begin demonstrating; however, one wisely commented “it was wonderful, but you still need to improvise and experience is the only way to learn those skills”.

Students thought they would gain many different things from demonstrating, including experience and confidence in teaching and public speaking and an appreciation of the difficulty of passing ideas and information on to others. For one student it was the opportunity to “Experience as someone who is giving others information and skills rather than receiving them”. For another, it appeared to serve a reinforcing role “… improve my ability to explain basic concepts of microbiology and through that give me more confidence in my own understanding”.

The second survey, taken after the honours students had completed both demonstrating sessions, showed that the majority of students felt a sense of achievement accompanied by relief and that their second teaching session had been more successful than their first. One student, however, was more concerned about how the engineering students rated his performance and commented, “Demonstrating felt great, but I’ll wait to see how they got on with their reports to know if I did a good job”.

Asked to name the greatest difficulties they had faced, the majority of honours students nominated judging the time needed for different activities included in the practical class; others nominated managing their own nervousness, managing slow students, answering questions and successfully demonstrating the techniques.

Overall many things had gone well, in particular their finding that the engineering students were interested, enthusiastic and attentive. A common remark was, “I had a good group of students who were friendly and eager to learn”. For one student, the best part was, “Earning the respect of the students and passing on knowledge effectively”; for another, “Being able to answer their questions”.

When asked what changes they would implement in any future teaching, students focused on more effective time management, such as: “keep the students moving especially the slower students” and more careful preparation and detailed explanation. One student said he would “Be less nervous and talk at a slower pace”, another that he would “Practise the techniques more beforehand”.

Honours students were adamant that they had learnt many different things from the experience, including a heightened sense of their ability to take a leadership role and to direct and convey ideas to people. Several reported feeling a significant boost to their self-confidence and self-worth. Overall students said they enjoyed the experience and found it useful. Best of all was the simple statement: “Demonstrating is fun”. Many comments showed an appreciation of the skill and training needed to teach effectively:

“A teacher’s job isn’t as easy as it looks because it depends on the students as well.”

“How different it is knowing how to do something to teaching others how to do something.”

“Thank you for making this part of our course.”

“I enjoyed this aspect of the coursework. It was a nice change from the rest of coursework and lab work.”

“It was definitely a fun and worthwhile experience.”

The engineering students also responded positively. Eighty-four per cent said the microbiology practical classes helped them understand the microbiology material covered in lectures and 82% said the microbiology demonstrators were well-prepared and helpful in the practical classes.

Conclusion

Practical classes offer unique possibilities for discussion and interaction between students and teachers. They are ideal settings in which to enhance the quality of student learning, but only if careful planning and preparation has preceded the actual class. The honours students’ survey responses showed they understood the importance of being well-prepared so they could communicate clearly what needed to be done and how and when to do it.

Their obvious enjoyment and pleasure in interacting with the students augers well for their participation in practical teaching in subsequent years. The positive response by their pupils further confirms the value of continuing this exercise.

References


Biography

Cheryl Power is a lecturer in the Department of Microbiology & Immunology at the University of Melbourne. She has taught microbiology to students enrolled in many different courses for over 30 years. Her educational research interests include the use of assessment to drive student learning and the importance of practical class experiences in microbiology courses. She was Convenor of the Education Special Interest group for over 15 years and was the Guest Editor of Microbiology Australia, Volume 24, No. 4, November 2003 which was the first issue of the journal devoted entirely to educational issues.