

# Fostering deep approaches to learning: collaborative learning and peer assessment

Lisa Tee

School of Pharmacy, Faculty of Health Sciences, Curtin University, L.Tee@curtin.edu.au

The main challenge for teachers of pharmacology is to transform students' perceptions from 'pharmacology = an extensive amount to know and remember' to 'pharmacology = an interesting and essential subject that enhances competency in both clinical pharmacology and the prescription of medications'. This poster outlines a novel method of integrating a range of teaching techniques including case-based learning, collaborative lecture review and group work in the preparation of a final written examination, which was followed by peer assessment and an evaluation process. These strategies were implemented in a third-year pharmacology unit in the Bachelor of Pharmacy at Curtin University in the first semester of 2010, involving 138 students. Results of a pilot study indicated that 99 per cent agreed that the combination of collaborative learning, exam preparation and peer assessment helped them to achieve the unit learning outcomes; 98 per cent responded positively to the collaborative lecture review; 82 per cent agreed that preparation of the exam questions helped them to adopt a deep approach to learning for understanding; and 78 per cent found that peer assessment helped them to take a deep approach to learning (Ramsden 1992). Interestingly, due to an error in communication between the unit coordinator and tutors, the exam was conducted as an open-book exam in some classes, and thus differed from our original intention. The students who rated peer assessment less favourably perceived that an open-book exam had not helped them to achieve the unit learning outcomes.

**Keywords:** collaborative learning; internalisation; marking keys; peer assessment; pharmacology

**Theme:** assessment for sustainable learning within and beyond the course

## Background

Peer assessment and collaborative learning have been increasingly used in tertiary education in recent years and been shown to improve students' understanding of the assessment process (Bloxham & West, 2004). Acknowledging that assessment drives learning and plays a major role in shaping students' perceptions of learning (Ramsden, 1992), collaborative learning and peer assessment were implemented to promote deep learning in pharmacology, a core discipline in medical, nursing and other allied health sciences. It is imperative that pharmacology be taught effectively to avoid the risk of error in the prescription of medications. The main challenge for the pharmacology teaching team is to transform the student's perception from 'pharmacology = an extensive amount to know and remember' to 'pharmacology = an interesting and essential subject that enhances competency in both clinical pharmacology and the prescription of medications, through a combination of case-based learning, collaborative coaching and peer assessment'.

This paper describes a novel method that integrates a series of teaching techniques, including case-based learning, interactive collaborative lecture review, group work in the preparation of final written examination questions, peer assessment and an evaluation process. This method was trialled in Semester One, 2010, in a third-year pharmacology unit in the Bachelor of Pharmacy course at Curtin University. The project involves several stages in which both students and tutors worked closely as a team.

## Stage 1: Collaborative coaching fosters internalisation of knowledge

Students worked collaboratively in reviewing all the lectures taught in cardiovascular pharmacology and working on case studies. This exercise aimed to encourage peer coaching and to allow knowledge to be internalised through interactive discussion using a case-based approach. A student leader was appointed by students to chair the discussion in a group of four to six students. The role of group leader was rotated in each group over the various tutorials in which this series of activities was conducted.

## Stage 2: Assessment drives learning

Following the review of lectures, the students' next task was to formulate and prepare a question accompanied with a clear marking key for the final written exam. Guidelines were provided by tutors, along with expectations of the minimal standard of questions, with the main focus on application of knowledge rather than listing or reciting of information. Each group prepared a question worth 15 per cent for the exam paper. For each tutorial session there were four groups, each of four to six students. It was envisaged that this would assist with students' understanding of the assessment process, in particular in the new units after the Bachelor Pharmacy course has undergone a complete curriculum review.

### **Stage 3: Moderation ensures appropriate assessment design**

Questions prepared by student groups were reviewed by tutors and unit coordinators. Where appropriate the questions were moderated to ensure that they adhered to assessment guidelines.

### **Stage 4: Peer assessment fosters deep learning**

In the following week, students undertook their peer test, working individually on the assessment and adhering to a specified timeline. The completed test was marked by peers who had prepared the question and marking key, on a one-on-one basis. The peer-assessment process was facilitated by tutors. Students were encouraged to provide feedback to their peers. The individually marked papers were then open for discussion within the group, to enable peer review of peer marking.

### **Stage 5: Evaluation of student's perception on collaborative review and peer assessment**

Students were asked to provide feedback on the whole peer coaching and peer assessment process supported by peer review of lecture materials. The objectives of this initial pilot and informal evaluation process were to:

- 1 ascertain whether the whole process of reviewing of lectures and preparation of exam questions with a marking key, followed by peer assessment, is worthy of implementation in other pharmacology units
- 2 assess students' perception of the usefulness of preparation of exam questions and a marking key, to ascertain whether the process encourages deeper understanding of the complexity of pharmacology
- 3 answer the research question, which asked whether collaborative teaching and learning enhance understanding and application in a complex subject
- 4 assess students' perceptions of the use of peer assessment.

### **Outcomes and significance**

A key element of the recent drive to make assessment more transparent to both students and tutors has been the articulation of an assessment framework (Rust et al., 2003). This paper describes a novel method of allowing students to assume the role of the teacher in the preparation of questions for a final examination. In this informal pilot study involving 138 students: 99 per cent of students agreed that they found that this integrated teaching – using a combination of collaborative learning, exam preparation and peer assessment – helped them achieve the learning outcomes; 98 per cent responded positively to having collaborative learning in a lecture review; 82 per cent agreed that the preparation of exam questions helped them to achieve a 'deeper approach' to their learning and understanding; and 78 per cent found peer assessment helpful for their learning.

Interestingly, due to an error in communication between the unit coordinator and tutors, the exam was conducted as an open-book exam in some classes, which differed from our original intention of a closed-book exam. The students who scored less favourably commented that the open-book format had not helped them to achieve the learning objectives, and suggested that it should be a closed-book exam. Students also noted that their experience was much affected by the tutors who facilitated the process.

This project will be conducted again with second-year students in Semester Two, 2010, with some modifications to enable monitoring of increased understanding and retention of knowledge.

## References

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