

- The students learn by marking their peers work.
- Once students were reassured about the mechanics of the calibrated peer-assessment they understood the relevance of peer review.
- Some students welcomed the change, but most perceived the calibration and reviewing process just as extra work.

Aside from the improved student learning, one of the key benefits for staff is reduced workload in providing adequate and timely feedback to students.

It was important that the students saw, reviewed and criticised the work of their peers and therefore an alternative assessment strategy was introduced six years ago and has remained little changed. It is now used in two other modules as well, another Year One module, Biodiversity and a Year Two module, Biological Techniques and Analysis.



'HOW TO DO IT'

The method currently used in the Transferable Skills module can be summarised as follows:

1. The Year One cohort usually consists of approximately 30 students but this number has been as high as 60+ in recent years. In week five of semester one, the students receive two sessions on the construction of posters — these focus on presentation and content. At the same time they are given the poster titles together with a few starter references. In previous years these have largely been related to popular issues in biology but this year, in anticipation of the introduction of Personal Development Planning, the emphasis was switched to careers and placements. Students form groups of three or four and work on their posters over the next few weeks and these are then displayed outside the main teaching laboratories during week eleven.

2. The poster in the Transferable Skills module is worth 10%. In other modules it may be higher (for example, in the Biodiversity module it is worth 15% with an associated seminar and log book of the process being worth a further 10%). A small number of marks are allocated for how conscientiously students have marked the posters.

3. Bearing in mind the difficulties outlined above when all students marked all posters, the process now involves:

- a. Each student is given a number of marking sheets. The number of sheets depends on the number of groups and the number of students but is usually two or three.
- b. Each marking sheet bears the titles (or numbers) of two of the posters on display but not including the poster of the group to which the student belongs.
- c. The rest of the marking sheet has a series of criteria divided into two categories, presentation and content; the student is expected to view the two posters and to make positive and

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Peer-assessment of scientific posters — the league fixture approach

BRIAN RUSHTON



BACKGROUND AND RATIONALE

Within the Biology degree at the University of Ulster, posters are used in many modules and training is provided in a Year One Transferable Skills module on the elements that go to make up a successful poster. One of the learning outcomes of the Transferable Skills module is to develop the students' critical abilities and peer-assessment of the posters was the vehicle used for this. Essentially, each student is asked to assess each poster independently using marking criteria that had been discussed with the class beforehand and the marks amalgamated and overall marks awarded that included an element from the tutor.

However, this did not prove entirely satisfactory. The workload for an individual student was high (typically between 10 and 18 posters) and also the students found it difficult marking to an absolute scale. The instructions required that the elements of the assessment be scored on a 0–10 scale with 4 being a pass mark. The concept of what constituted a fail was difficult and even the worst posters were given good pass marks.

negative comments under each heading for each of the two posters. The comments do not translate into a numeric score — this was where the students found real difficulty when they had to score the assessment criteria on a 0–10 basis.

- d. Instead, after they have made their written comments, they have to state which poster is the best and to justify their decision on the basis of the individual comments they have made. This justification is no more than two to three sentences.
- e. They are allowed to state that the two posters are equally good (or bad) if they really find it difficult to decide between them but they are strongly encouraged to 'find a winner'.

4. The marking sheets are designed like the games in a series of sports fixtures so that each poster 'plays' every other poster — the number of groups and the number of students will allow each poster to 'play' every other poster at least twice. For example if there are 40 students in groups of four there would be ten groups. For the whole 'fixture list' there would be 90 group comparisons (or 'games') with each student being responsible for two or three comparisons.

5. The 'winner' of a comparison is allocated two points, the loser none — with 'drawn' comparisons being allocated a point each (I haven't introduced the three points for a win and one point each for a draw system!) and the points totalled for each poster.

6. The posters are then ranked on the basis of the number of points awarded. At this stage it may be necessary to modify the points total if a student or students have failed to return the mark sheets — there are usually two or three students who opt out. Simply calculating the average number of 'points' awarded per 'game' is a simple solution to this problem.

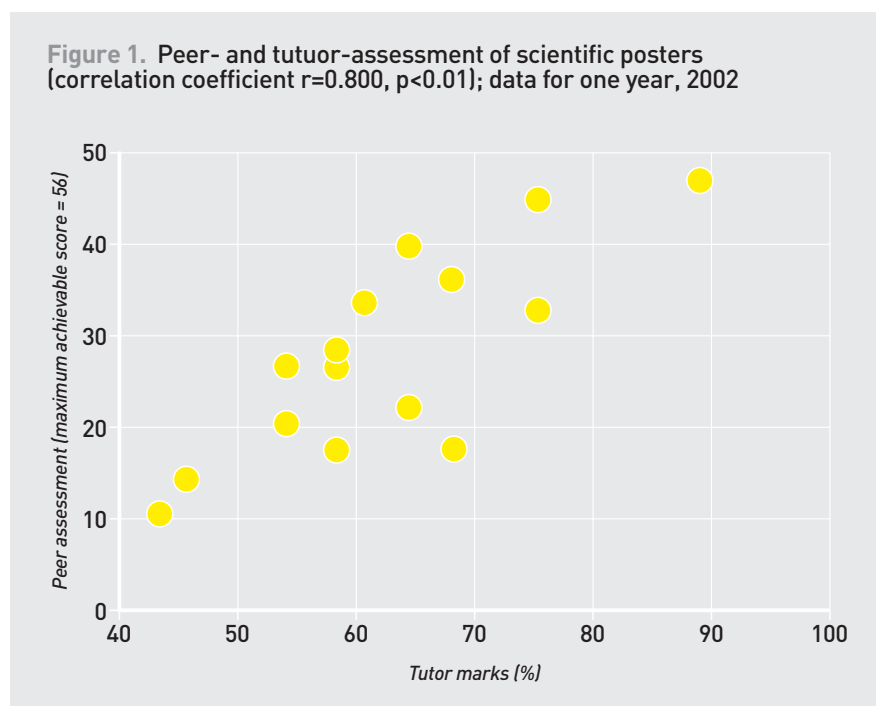
7. I also mark the posters using my own assessment criteria and my marks and the students' points totals are amalgamated to give a final grade. I have experimented

with a number of ways of doing this and the method currently used is to rank my marks and those of the students separately and add the two ranks together and allocate a grade and a percentage mark on the overall rank. Thus, the highest ranking poster would get an A and a mark of (say) 85%. Generally, posters do not fail!

DOES IT WORK?

Overall, are students able to produce a sensible assessment of the posters? In Figure 1, the marks derived from the tutor (a percentage score) are plotted against the overall 'points' score of the class (adjusted for missing students) — the correlation coefficient is 0.800 (df = 13, $p < 0.01$) — suggesting that overall peer-assessment is remarkably consistent with the tutor's marks. Where there were significant discrepancies between tutor marks and those of the students this was usually for posters that had excellent presentation and poor content; in the students' minds the visual impact clearly outweighed the scientific content.

Correlation between tutor marks and those given by students are often low — several examples, drawn from a number of studies spanning a wide range of subject areas are discussed in Griffiths, Houston and Lazenbatt (1995). However, the usual approach adopted is for students to allocate marks on an absolute scale and this may explain the poor agreement compared with that reported here.



The students find this method of 'marking' much easier to cope with as they are simply making a judgement on which piece of work is best; they are not trying to use a numerical scale or mark against an absolute scale. This came out clearly in the module evaluation. It also means that they are focussing on a smaller number of posters and therefore more likely to learn and remember the content. One added advantage is that the mark sheets can be used directly as feedback to the groups.

WHAT DO THE STUDENTS THINK?

There is little doubt that peer-assessment is a valuable experience and is appreciated by students. In a previous peer tutoring and assessment exercise (Cook and Rushton, 1995) where Year Two students taught information technology skills (MS Word and Excel) to Year One students and then assessed them, the comments of the student tutors were very supportive of peer-assessment:

"Showed me how lazy and careless people could be with their work."

"Makes me reconsider and reassess my own work and the way I do it."

"It taught me ... how much better and assignment can look and read when more time is spent on it."

It would seem therefore to be a worthwhile exercise. However, it should not be seen as just an alternative to tutor marked assignments but should have clear, non-assessment outcomes — in this case, the development of critical faculties. As Biggs (1999) points out "Peer-assessment [is] not so much an assessment device, but a teaching-learning device."

ACCOMPANYING MATERIAL

The accompanying website to this guide (<http://www.heabioscience.academy.ac.uk/TeachingGuides/>) contains an extended version of this case study and the following additional material:

- notes on the assessment of posters;
- poster marking sheets.

Peer-assessment of group work in a large class — development of a staff and student friendly system

BARBARA COGDELL, ANDREA BROWN
& AILSA CAMPBELL



BACKGROUND AND RATIONALE

The first year biology course at the University of Glasgow is divided into two modules. Part of the assessment (20%) for the module in the second half of the year is a "Lifestyle Assignment". The subject specific aims are to investigate and evaluate the lifestyles of (a) species other than humans and (b) humans in other parts of the planet. A portion of the assessment is individual written work, but the majority of the marks are for the group work element of the Assignment.

There are two tasks for the group work, a debate and the manufacture of a poster. The debate is based on Darwin's dilemma. The students are required to argue the case for eliminating a species of their choice whose lifestyle is too damaging to the planet. Then they also argue the case for the preservation of another species chosen by another group. The second task is to produce a poster which compares the lifestyle of people in Britain with that of people in another country.

There are between 600 and 700 students taking the module. They are divided into 14 laboratory classes with roughly 48 students in each. Each of the lab classes is further divided into six groups of eight students — a total of 84 groups. The students have already worked together in the lab during the previous semester as they are always required to sit in the same lab position and they have already participated in a group discussion exercise. The groups meet both in scheduled lab sessions and in their own study time so that they can research their topics. Though the scheduled lab sessions are run by members of staff, the staff cannot monitor what happens when the students meet outside their lab sessions. The groups are encouraged to monitor themselves. Therefore they