BIOSCIENCE CASE STUDIES

The following section contains a collection of seven bioscience case studies. All the case studies have been written by bioscientists who have implemented self- and/or peer-assessment into their own teaching. The case studies are organised around common headings ('Background and rationale', 'Advice', 'Troubleshooting', 'Does it work?' and 'Further Developments'), but each study reflects the author's individual style and preference.

CASE STUDY 1
THE EFFECT OF MARKING CRITERIA AND EXEMPLARS ON STUDENTS' LEARNING
DURING PEER- AND SELF-ASSESSMENT OF SCIENTIFIC POSTERS
Stephen Merry & Paul Orsmond Faculty of Health and Sciences, Staffordshire University,
Stoke-on-Trent ST4 2DE. *Email: s.merry@staffs.ac.uk*

CASE STUDY 2
ON-LINE CALIBRATED PEER-ASSESSMENT — STUDENT LEARNING BY MARKING ASSIGNMENTS
Victor Kuri School of Biological Sciences at Seale Hayne (Food Technology), Seale-Hayne Campus,
University of Plymouth, Newton Abbot TQ12 6NQ. *Email: V.Kuri@plymouth.ac.uk*

CASE STUDY 3
PEER-ASSESSMENT OF SCIENTIFIC POSTERS — THE LEAGUE FIXTURE APPROACH
Brian Rushton School of Environmental Science, University of Ulster,
Coleraine, Northern Ireland, BT52 1SA. *Email: BS.Rushton@ulster.ac.uk*

CASE STUDY 4
PEER-ASSESSMENT OF GROUP WORK IN A LARGE CLASS —
DEVELOPMENT OF A STAFF AND STUDENT FRIENDLY SYSTEM
Barbara Cogdell, Andrea Brown & Ailsa Campbell Institute of Biomedical and Life Sciences,
University of Glasgow, Glasgow G12 8QQ. *Email: B.Cogdell@bio.gla.ac.uk*

CASE STUDY 5
PEER-ASSESSMENT OF PRACTICAL WRITE-UPS USING AN EXPLICIT MARKING SCHEDULE
Ian Hughes School of Biomedical Sciences, University of Leeds, Leeds LS2 9JT.
Email: i.e.hughes@leeds.ac.uk

CASE STUDY 6
WRITING AND REVIEWING AN ARTICLE FOR A SCIENTIFIC MAGAZINE —
A PEER/SELF-ASSESSMENT EXERCISE
Rob Reed Division of Biomedical Sciences, Northumbria University,
Newcastle-upon-Tyne NE1 8ST. *Email: rob.reed@unn.ac.uk*

CASE STUDY 7
PEER-ASSESSED PROBLEM-BASED CASE STUDIES
Charles Brennan, Elizabeth Folland, Rick Preston & Nicola Blatchford
School of Biological Sciences at Seale Hayne (Food Technology), Seale-Hayne Campus,
University of Plymouth, Newton Abbot TQ12 6NQ. *Email: c.s.brennan@massey.ac.nz*

It is hoped that these cases studies will provide guidance, inspiration, as well as practical advice on how to implement self- and/or peer-assessment in the biosciences. There is also a accompanying website to this guide (http://www.bioscience.heacademy.ac.uk/TeachingGuides/). The website contains a further practical material to aid the reader in implementing self- and/or peer-assessment. The site includes expanded versions of the case studies, further bioscience case studies, explicit marking schedules and criteria to download, as well as video streams of peer-assessment.

1

The effect of marking criteria and exemplars on students' learning during peer- and self-assessment of scientific posters

STEPHEN MERRY & PAUL ORSMOND

BACKGROUND AND RATIONALE

The authors of this report are practicing lecturers with an interest in the influence that assessment practices have on the way that students learn. This "case study" is the combination of four studies investigating student and tutor perceptions of poster marking criteria at Level 1 undergraduate modules within the general field of Biology. Self- and peer-assessment exercises of the students' completed posters together with organised, but informal, formative feedback sessions were used to provide data concerning students' and tutors' perceptions of marking criteria.

The precise learning outcomes of the component individual studies differed, but overall it can be stated that, *'at the end of their participation students should be able to'*:

- explain the meaning of specific marking criteria in a professional biological context;

- provide appropriate formative feedback to colleagues concerning their performance;

- engage meaningfully in the process of peer review as used by professional biologists;

- reflect more on the assessment process as part of their own learning and thereby enhance their learning.

'HOW TO DO IT'

The formats of the four studies were similar, but not identical. The approach described below is a composite which reflects how we would now run such a study.

Stage 1
(4–6 weeks before the poster assessment exercise)
Students were informed that:

- they were required to make a scientific poster, the date of the poster assessment exercise and the topic of the poster;

- posters are a recognised format in which scientific researchers present their results i.e. the assessment was relevant;

- they were required to supply particular materials (i.e. paper headings, adhesives etc) in order to construct their poster and the size of the poster boards;

- they would work in groups of approximately five to discuss the marking criteria, but they would be required to produce individual posters;

- more details would be provided at a later date.

Stage 2
(3–4 weeks before the poster assessment exercise)
Either students were informed what the marking criteria were (if they were tutor provided) and were then allowed time (approximately 30 minutes) to discuss the meaning of the marking criteria in their groups with tutors circulating among the groups to contribute to the discussions.

Or students were allowed time (approximately 45 minutes) to work in their groups to both generate, discuss and refine their own poster marking criteria and agree them with tutors circulating among the groups during this process.

Students were then informed that:

- they would be required to peer-assess the posters of others and self-assess their own posters using the marking criteria they had just discussed and that tutors would also assess the posters using the same marking criteria;

- anonymous peer review was a process utilised by professional scientists which was fundamental to establishing the credibility of scientific publications i.e. they were engaging in genuine professional practice;

- they should regard the self- and peer-assessment activity as a vehicle for developing

specific skills such as self reflection and objective judgement required by professional biologists;

- their posters were to be presented anonymously to reduce any bias in the assessment;

- their self- and peer-assessment would contribute to the overall grades awarded for the exercise and that tutors were interested in the quality of comments made by students in addition to their accuracy of their marking compared to that of tutors;

- more information would be provided at a later date.

Stage 3
(1–2 weeks before the poster assessment exercise)

- Students were given written information concerning the meaning of the individual marking criteria. This information was influenced by the discussions that had previously taken place between tutors and students. It should point out both the meaning of the criteria and the misconceptions which some students seemed to have.

- Students were also given a copy of the marking form they would be required to use for the self- and peer-assessment of their posters and its use was discussed with them, paying particular attention to they types and usefulness of the feedback comments they might provide to their peers.

- Students were given the opportunity to view exemplar posters and to discuss them in their groups and with circulating tutors. They should decide what feedback they would give to the author of the poster and what grades they would award for each marking criterion.

- If student-derived criteria are being used to mark the posters, students should be given, in discussion with tutors, the opportunity to refine the criteria; although such changes should be agreed and discussed with the whole class since changes to the written information provided may be required.

- Students were reminded of the date and time of the poster construction and assessment exercise together with the materials they would need to bring to the session in order to construct

their poster, and the time they have available (i.e. 30 minutes) for poster construction.

Stage 4
(The poster assessment exercise)

In an initial plenary session students were informed:

- they will be randomly allocated to two rooms;

- they will be given coloured stickers to attach to their posters;

- they will be given 30 minutes to construct their posters before the start of the self- and peer-assessment exercise;

- they will be required to self-assess their own posters and then move to the other room where they are required to peer-assess all the posters having the same coloured sticker as their own;

- their self- and peer-assessment marking should be independent, i.e. they should not discuss their marks and comments with other students; although tutors were available to provide guidance regarding the usage of the marking forms;

- tutors were interested in the quality of feedback comments as much as the grades awarded;

- in their poster construction they should ensure that only their student number appears on the poster NOT their name.

At the end of the plenary session students were allocated to their rooms and given their individual coloured stickers to attach to their completed posters.

- The format was as described in the introductory plenary;

- Packs of marking forms (one form for each poster to be assessed) were made available to students at the commencement of the self- and peer-assessment exercise;

- At the end of the session tutors collected in the completed marking forms and elicited any informal feedback on their experience of the assessment process from individual students to enable the procedures to be refined for subsequent cohorts.

💡 ADVICE ON USING THIS APPROACH

Tutor discussion with students is the key to the success of the exercise. Tutor discussion should provide to students a) feedback regarding their interpretation and use of marking criteria and b) reassurance that they do have the ability to judge the scientific quality of a poster without the background knowledge necessary to judge the accuracy of the factual detail provided within it.

Posters produced by previous cohorts of students are a good source or exemplars. Students should be given the opportunity to view posters of differing styles and quality. It can help some students realise that attractive posters may, in some cases, have poor scientific depth.

If a sequential allocation of students to rooms and to peer-assessment groups (i.e. a sequential allocation of different coloured stickers) is adopted and these are allocated to students in turn as they leave the plenary session this helps ensure that friendship groups (who are likely to leave together) are separated during the assessment process.

In a 1-hour self- and peer-assessment exercise students should be asked to grade and provide feedback on a maximum of five posters; including their own. This is to enable them sufficient time to write meaningful feedback comments. The number of peer-assessment groups, i.e. the number of different coloured stickers used, should reflect this.

Self- and peer-assessment are skills that improve with practice. Furthermore, informal feedback from students has indicated that they are more willing to engage with the process at a deeper level if they meet it on a second occasion. If possible, repeated self- and peer-assessment exercises should be built into the curriculum rather than being delivered as single isolated events.

🔧 TROUBLESHOOTING

In some instances students were unwilling to award low grades, even if they thought they were deserved, to posters that they recognised as being those of their close colleagues. Furthermore, in discussions approximately one month after the completion of the exercise individual students have informed tutors that they felt other students (to whom they did award a low grade) were behaving differently towards them. To address this, tutors need to ensure posters are as anonymous as possible and that friendship groups are distributed into different peer-assessment groups.

Students do find the process challenging. This can be a surprise if they have initially a superficial view of presenting information in poster format.

Furthermore, some students feel they are not able to judge the scientific merit of posters whose topic is not strictly the same as theirs. They need reassurance and guidance that they can judge the scientific merit of a poster without being able to judge the accuracy of the detail present in the content.

Finally some students can treat the process in a rather cavalier fashion. Emphasising at the start that they are engaging in a practice which is employed by professional biologists to establish the credibility of their work helps to dispel this.

❓ DOES IT WORK?

Both formal questionnaires and informal feedback from students have indicated that self- and peer-assessment exercises caused students to reflect more on the marking criteria and their learning (Orsmond *et al.,* 1996; Orsmond *et al.,* 1997; Orsmond *et al.,* 2000; Orsmond *et al.,* 2002; Orsmond *et al.,* 2004). To this extent the approach does "work".

The ability of students to mark in an identical fashion to tutors should not be the sole criteria of success of self- and peer-assessment , but it can provide information as to the nature of the learning that is taking place. Our initial studies (Orsmond *et al.,* 1996; Orsmond *et al.,* 1997) demonstrated an overall agreement between student and tutor grades ($r^2 = 0.7$) comparable to that of other studies (Hughes and Large, 1993 and Stefani, 1992) with the agreement being greater for peer-assessment than for self-assessment. Consideration of the overall mark does, however, mask variations between tutor and student with regard to individual marking criteria. For example, students over-marked, compared to tutors for the criteria "visually effective" and "helpful level of detail", but under-marked for the criterion "clear and justified conclusion". The implication is that some students had written a clear and justified conclusion, but did not realise that they had done so. The necessity for dialogue with students concerning individual criteria was shown by these findings.

An interesting, and unexpected, outcome was that our studies, based on comparison of tutor and student grades, have indicated that the nature of the learning that has taken place differs dependent on whether the marking criteria are tutor-provided or student-derived (Orsmond *et al.,* 2000). The use of student-derived criteria might be expected to circumvent discrepancies between tutors' and students' marks for individual criteria since tutors, with their greater experience of interpreting marking criteria, would be expected to more readily understand student-derived marking criteria than, possibly, students understand marking criteria

provided by tutors. In our hands the outcome of using student-derived marking criteria was that students, although having ownership of marking criteria they had constructed themselves, were less able to discriminate between their own individual marking criteria than between those provided by tutors. Student groups either over-marked or under-marked all their marking criteria compared to tutors such that overall agreement between students' and tutors' marks was not enhanced. It may be that the act of constructing their own marking criteria caused students to view their posters in a more holistic fashion. An alternative interpretation of the finding is that students were able to interpret their marking criteria, but had a poor conception of the subject standards, i.e. both students and tutors knew what, for example, the marking criterion "self-explanatory" meant, but, despite the dialogue, they retained different conceptions of how self-explanatory the poster should be to achieve a particular grade.

Our final published study (Orsmond *et al.,* 2002) indicated that the use of exemplars was able to largely overcome discrepancies between grades awarded by students and tutors for student-derived marking criteria. The exemplars were posters pro-duced by a previous cohort of students and served as a focus for discussion and application of the marking criteria. In addition to improving accuracy of marking for individual criteria, feedback from students indicated that the use of exemplars can help students' learning such that higher quality learning outcomes, including reflection, are achieved; although exemplars may not necessarily help students in the process of poster construction. A recent study (Orsmond *et al.,* 2004) has revealed that peer-assessing students were less able than tutors to write constructive feedback comments to the poster authors. Students' feedback comments concerned primarily the quality of the presentation of material with little actual mention as to whether the discussed marking criteria had been met. Tutors' comments, alternatively, concerned primarily the nature and use of the scientific content of the poster in the context of the marking criteria. A possible explanation for this is that students may focus, when constructing a poster, on the poster itself (i.e. the product of their work) whereas tutors may regard the poster simply as a means to enable students to demonstrate the understanding of science they have developed (i.e. to show the process that they have undergone).

In summary, the strengths of the approach are that it causes students to reflect more on their work and their learning, but for this to happen, careful planning is required together with the allocation of class time for the activities.

FURTHER DEVELOPMENTS

The authors are currently investigating: How students' perceptions of marking criteria change during the course of the six week poster design and construction exercise; the type of distractions (i.e. student self-derived individual criteria that are distinct from the agreed marking criteria) which influence students' poster design and construction as well as how students use the feedback provided by tutors to enhance their learning.

2

Online calibrated peer-assessment — student learning by marking assignments

VICTOR KURI

BACKGROUND AND RATIONALE

One of the first things that markers have to do to evaluate work is to agree a set of standards. Somehow lecturers have to develop an understand-ing of what is a good assignment, what is average and what is poor. When I collect a pile of assignments for marking in an area that I have not set before, the first thing that I do is to try to find some of the extremes, and 'calibrate' my marking scheme.

The use of 'calibrated' exemplars can help students become competent at peer review and understand what makes a good (and bad) assign-ment. I use the web-based Calibrated Peer Review (CPR) system which was developed on a science-based model of peer review (http://cpr.molsci.ucla. edu/). The system is anonymous and could be used on-line or with printouts during a timed session.

'HOW TO DO IT'

Prepare an assignment brief, which ideally contains guidelines to set the criteria to which the work is going to be marked. It is best suited for text-based

assignments, short and well structured.

Following preparation and submission of the text the student proceeds through calibration, peer-assessment, self-assessment and feedback, and results.

Calibration

Each student is presented with an assessment questionnaire and one script at the time. They have to use the questionnaire (assessment schedule) to evaluate and mark the script. At some points, they are encouraged to provide feedback. They do this for three scripts in a random order, which were prepared by the instructor and are standardised to be of low, medium and high quality. Feedback is provided to the students to verify how close they matched the calibration scripts. There is the facility for students to re-take the calibration to improve their marking proficiency.

Review

Each student is presented with a script from one of their peers, randomly selected and coded to keep it anonymous. They have to evaluate it and mark it following the questionnaire, where they also provide feedback. This is done for three students (the work of this assessor will be correspondingly marked by three randomly selected reviewers)

Self-assessment

Each student is given the opportunity to mark their own script following the same criteria. This mark will be part of the overall mark.

Feedback and results

The feedback information is made available to each student (keeping the markers anonymous) and a composite mark is computed to reflect the effort of the participants, considering that marking could be time consuming and challenging.

By the time the students finish they should have understood what was required in the assignment, marked seven scripts and have received feedback on their understanding of the assessment system, the requirements and their own compliance. This is a formative exercise which allows students the opportunity to understand and explore the peer-assessment process.

This system had been used with final year BSc and MSc students for a range of assignments, including a case study, short practical reports, discussion and conclusions of practicals, virtual poster displays and a reflective assignment exploring issues of food ethics. The briefing may involve instructions for the students to carry out an activity using a range of software, calculations, virtual (or laboratory) experiments, etc. Students have subsequently to write the outcome as a text report.

ADVICE ON USING THIS APPROACH

Setting up the method can be time consuming, but once the assignments are designed, the system is easy to manage and the assignments can be administered to large groups with minimum effort. The on-line system does not work with files of web pages by itself, but it is possible to set up a repository of files or webpages (i.e student portal in the university intranet, or internet) and ask the students to input only the weblink to their work or a code to the file previously up-loaded by the instructor.

TROUBLESHOOTING

The idea that the lecturer was not marking the assignment was alien to some of the students who felt uneasy because their peers were going to mark them. Others felt that they were not capable of marking assignments. A briefing session was introduced to manage students expectations and to motivate positive participation. Detailed instructions and a tutorial were set up to help students with limited IT skills.

One potential problem with the on-line CPR system is that the students obtain marks in ranges atypical for the group or university marking scheme. The marks can easily be normalised or the system re-set to provide different weighting for the text and each one of the tasks. Also, the threshold levels to give marks after successful completion of each task could be modified; i.e. if the self-assessment is less than 1.5 points from the reviewer's average mark (in a scale from 0–10), then 10 points are awarded, if it is >1.5 and >=2.5, 5 points but if it differs more that 2.5 points, then no points are awarded).

DOES IT WORK?

The overall impact on students can be summarised as:

- Students realise that there are marking schemes and that these can help in achieving higher marks. Marking schemes also help them to focus their effort in further coursework.

- Students experience marking their peers and providing and receiving feedback to and from their peers.

- Some students enjoy being empowered to assess coursework and find it interesting and the responsibility challenging.

- 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.

3

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.

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

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.
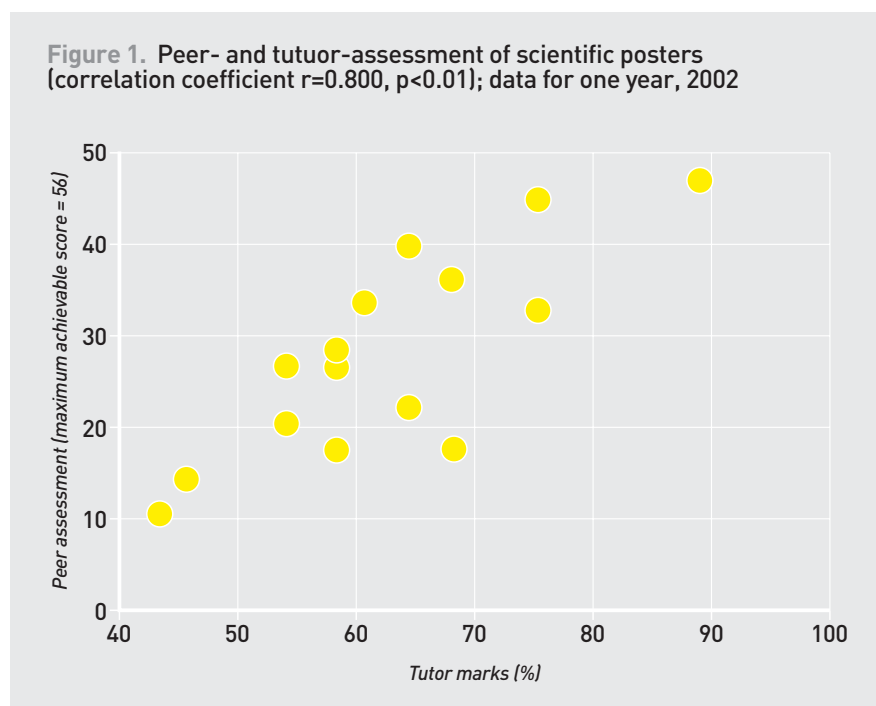
7. I also mark the posters using my own assessment criteria and my marks and the students' points totals are amalgamated to give a final grade. I have experimented with a number of ways of doing this and the method currently used is to rank my marks and those of the students separately and add the two 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.

Figure 1. Peer- and tutuor-assessment of scientific posters (correlation coefficient r=0.800, p<0.01); data for one year, 2002

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

are required to elect a group leader and he/she is asked to make notes of who attended the sessions and who did what within the group.

The Lifestyle Assignment replaced a previous group work activity which was based on the theme of AIDS. There were continuous complaints that staff did not assess the group work that was required for the debates. Also group members did not like carrying non-contributors. During the last couple of years of the AIDS project, this resulted in a high proportion of the students failing to contribute to the debates.

It was decided in the Lifestyle Assignment to mark the group work to ensure motivation. It was also felt to be important to introduce a method of distinguishing individual contributions, i.e. to introduce peer-assessment. The method of peer-assessment has evolved over the three years of the Assignment's existence. Part of this has been enabled by the availability of appropriate technology.

Before the introduction of this peer-assessment to our Level 1 course our only experience of peer-assessment had been in a Level 2 Biology module. This had involved a much smaller number of students, 140 versus 650. Although the method of peer-assessment had been very successful it was considered unsuitable to be scaled up to a larger group. Therefore we looked for a system requiring less administrative time.

YEAR 1 — KEEP THE ADMIN SIMPLE

Two members of staff gave each group a mark out of 100 for their debate and poster. The mark was multiplied by the number of members in the group. The group was told their total marks and they then had to divide the marks between themselves. So if the group had eight members and they were given a mark of 60, this gives a total mark for the group of 480. If they decided that they had all worked equally hard they could each get a final mark of 60% for the project. However if they decided two members of the group had worked particularly hard they could have more marks and if one person had done nothing they could agree to give that person 0. This might result in two members of the group getting 90%, five members getting 60% and one getting 0. A constraint was put that nobody could have over 100%.

The students allocated their marks together in a group in a scheduled lab session. Each group was given a single form with the full names and matriculation numbers of each of the members and a space to write their marks. At the end of the session the lab leader handed in the completed list of marks as communally agreed. Many groups agreed to share the marks equally amongst themselves.

This scheme was fairly simple to run as there was only one sheet of marks per group for staff to enter into the assessment spreadsheet. Checks were made to ensure that the students had made correct calculations. Any queries could be sorted by consultation with the group leader. Students awarded zero by their group were investigated by staff for extenuating circumstances such as illness.

However the students did not like this scheme at all. They did not like hammering out the marks in a group setting. They did not like giving low marks to colleagues face to face. Consequently non-contributors would get the same marks as everyone else and the rest of the group would feel resentful. Alternatively the group would mark a member down and this person would complain vociferously. In the worst cases groups split into two or three factions (this only happened on two or three occasions).

It is always to be expected that some groups will be dysfunctional. However with the large number of groups involved, and as the mark counts towards their final module mark, it is unrealistic to tell the groups that they should sort things out by themselves. The students have to be given marks, so this scheme resulted in a lot of extra work for the staff trying to monitor these problems.

YEAR 2 — MAKE THE MARKING CONFIDENTIAL AND AUTOMATE THE MARKS CALCULATION

In the second year of the Lifestyle Assignment the department was fortunate to acquire an Intelligent Character Recognition (ICR) system. This machine will read forms with text entries. With the use of this technology it became feasible to get each student to submit a form with marks for each of the other members of their group. The forms are read automatically and marks entered into a spreadsheet. Then the subsequent calculations can be made automatically. Using individual forms meant we could change the peer-assessment protocol so that the students could give their marks for the other members of the group confidentially.

Each student was given a hard copy form with their name and matriculation number at the top. Below was a table with the names and matriculation numbers of the members of their group, not including themselves. The forms were generated using the mail merge function of Microsoft Word and Excel. Extra spaces were provided in case an extra student had joined the group without the teaching staff's knowledge. This could happen if a student was absent when the groups were formed or had completely failed to get on in an original group.

As before the debate and poster together were

given a mark out 100. Again this mark was multiplied by the number of students to give the total group marks. The students were asked to enter a mark out of 10 on their forms for each of their colleagues in the group. The forms were read by the machine and an average peer mark (out of 10) was calculated for each student. All the average marks for the whole group were added together to give a sum of peer marks for the whole group. This was then used to calculate the proportion of peer marks that each student had obtained. The final mark for each student was then calculated as this proportion of the total group marks. Although it is possible to get over 100% with this formula we will cap any one student's mark to this maximum. So far this situation has not arisen.

A major advantage of this scheme is that it takes into account whether the students are harsh or lenient markers.

Obviously the system will not work if students fail to return their forms. Consequently the students were told that they would get no marks for their project if they failed to hand the forms in — there was a very high return rate of forms.

The students were much happier with this scheme. The students appreciated being able to reward hard work and penalise freeloaders. There were favourable reports from both the end of module evaluation questionnaires and the staff-student committee meeting. Some of the students with low grades complained but because the group leaders had been instructed to keep attendance registers it was relatively easy to point out to them that they had contributed very little and they usually agreed without further complaint.

This second scheme solved the problems as far as the students were concerned, but there was still a major administrative problem for us relating to the reading of the forms. Although the ICR system was very efficient it relied on the students using legible script and filling all the boxes in correctly. In particular problems occurred when a student failed to give an absent student 0 rather than leave the form blank. Each time the forms were illegible or filled in wrongly, they had to be checked by the operator. With the large numbers of students involved this became very onerous.

YEAR 3 — MOVE THE ADMIN ONLINE

As a result of the problems we have changed the system again this year. This time the students are required to enter their marks for their colleagues using a web-based form. The web forms have built in validation so that they cannot be submitted with any blank fields. Each student is sent an email giving them a unique URL code which has been generated from their matriculation number and name. This URL gives them access to their own individual website which has a web form with a list of their other group members and spaces to enter their marks.

The system is currently working well. It is important to emphasise that we have only been able to cope with running a successful peer-assessment scheme for such a large class, because we have had the assistance of a dedicated IT specialist and suitable technology. The programming required for generating the web forms and using Excel to calculate the marks is not extremely advanced. It can be done in a number of ways, but does require someone with suitable experience.

FURTHER DEVELOPMENT

One factor that perhaps could be improved is what we tell the students about how their final grade is calculated. In their instructions for the Lifestyle Assignment they are told:

"You will be allocated a mark according to the overall group performance (i.e. a mark for the poster and the debate) *and* to how your own group has assessed your contribution to the group tasks".

This seems to be perfectly adequate but there are always a few students who like to know precisely how their mark is calculated. On reflection following writing up this case study, in future we will use the explanation given here as information on the students' Level 1 Biology website.

5

Peer-assessment of practical write-ups using an explicit marking schedule

IAN HUGHES

BACKGROUND AND RATIONALE

This method of peer-assessment was introduced into a first year pharmacology programme with 50–160 students per year and has also been used with 2nd year medical students (275). Many of the learning

objectives were particular to the content of each of the exercises to which peer-assessment was applied but, in addition, some generic problems and learning objectives were addressed by use of this method of peer-assessment:

- *Utilization of feedback.* There was little evidence that students took any notice of (or even read) the material laboriously written on each practical by members of staff. This method provides each student with a full explanation of what should have been done. Every students gets excellent and timely feedback to which, by the nature of the process, they must pay attention.

- *Development of critical evaluation skills.* Students have to make judgements about the quality of their work to achieve the standards to which they aspire and in order to time-manage their activities. This is not something which comes easy to all students and practice with critical evaluation in the early part of a course helps prepare students for what they will need to do later. The ability to be critical of your own work and that of others is a valuable transferable skill. Surveys show graduates in first employment have to assess the work of others surprisingly early in their jobs. Graduates are often not prepared for this.

- *Better understanding of the material.* Students, like everyone else, need a better understanding to assess something than to produce it. This is particularly true if dealing with somebody else's work where the words and their order are not those you yourself would have used.

- *Improved learning.* This method provides a second look at the material covered. Learning is improved and reinforced by the feedback resulting from participation in the assessment process.

- *Motivation.* This method enables students to see the standard others achieve and where their own work may be improved. This is more powerful than seeing a 'perfect answer' written by a member of academic staff ('of course they can produce a good answer or they wouldn't be on the academic staff!'). Seeing your peers are doing a much better job than you are even when subject to the same pressures is a powerful spur for improvement.

- *Developing independence.* Students confront the 'personal relationship' issue and learn to make assessments independent of any personal relationship. This requires a very different attitude to that which many students have on leaving school ("always look after your mates").

- *Significant reduction in marking time.* The time involved in marking practical write-ups each week was becoming unsustainable as student numbers increased. Using peer-assessment 250 or more practical write-ups can be marked in one hour.

'HOW TO DO IT'

The task for the students was to provide a write-up, following a set of instructions, of a scheduled laboratory practical or computer simulated experiment. This practical schedule usually included some questions to test the students' understanding of the material. Written answers to these questions were required as part of the practical write-up.

The write-ups are handed in by a published deadline and there are penalties for being late. Work presented by the deadline is stamped as being received (this stops students slipping late write-ups into the marking session). Split groups may have different deadlines providing they are not too far apart. Time is set aside in the timetable (1 hour) for a marking session and it is made clear that attendance is compulsory, any student missing (without good reason) the marking session looses half the marks they are assigned. It is important to be firm about this as if 200 students do the work and only 120 turn up to the marking session *you* have to mark the other 80 write-ups! At the marking session, having previously explained the advantages of peer-marking, I distribute the write-ups and a record sheet on which the marker fills in their name, the name of the student being marked, the final mark awarded and signs to accept responsibility. An explicit marking schedule is distributed. I emphasise the need for silence during marking and enforce it. I then go through the marking schedule step by step explaining, with pre-prepared slides or acetates, how things should be done, what graphs should look like etc.

Students annotate the write-up they are marking as appropriate and decide what proportion of the marks allocated for each point should be awarded for the material presented. Students asking if a certain wording is worth x or y marks are told they must make the decision from the information they have. Students total the marks awarded, fill in and sign the record sheet. The write-ups, marking schedule

and record sheet are collected so marks can be recorded and then the write-up and marking schedule are made available for collection by the owner. Students are told that a portion of the write-ups will be check marked by staff and that any student who feels they had been marked unfairly could have their write-up re-marked by a member of academic staff (less than 2% do so).

💡 ADVICE ON USING THIS APPROACH

Generally, for students, the process of self-assessment is easier to perform than peer-assessment. I often make the first exposure one of self-assessment and then progress to peer-assessment. It is easier to find key words and phrases in work you have done yourself since you know where everything is. This makes the assessment process easier. However, there is a tendency to assess what you meant to write rather than what is actually there. In addition there is a greater potential for cheating as it has been known for students to fill in or change material in their own submitted work while assessing it. However, self-marking does provide an easy introduction to peer-marking and this can be useful.

Not all practical work is easily amenable to this method as it really hinges on the task set. Work resulting from following a practical schedule is readily peer-assessed. The same measurements have been made with similar data obtained and processed the same way. The write-up needs to follow a specified format that controls the order in which material is presented and the type of data presentation (e.g. present the data in a table, draw a graph etc.). This enables an explicit marking schedule to be provided with the material broken down into small pieces, each of which is associated with specific criteria or requirements for marks to be awarded. Thus, work in year 1/2 is more likely to fulfil these requirements.

Work resulting from a task like 'Describe an ideal vehicle' is not easily peer-assessed except at the very broadest level, since 'vehicle' may have been taken to mean different things (storage vehicle, transport vehicle, communication vehicle or vehicle in which to dissolve something) and 'ideal' will depend on where the writer is coming from. The marking schedule to meet all possibilities is either so general as to ignore specific content or so extensive that it takes too long to write and is very difficult for students to follow. Final year level work, where several completely different but valid approaches to the task could have been taken, is therefore difficult to peer-assess using the simple methods described here. Likewise, "Is the work well presented?" is not a reasonable question as there are no specific criteria associated with it. Each student may make a judgement based on different criteria and considerable personal preference may come into the assessment.

The practical work needs to be done by the student body over a short period of time so the assessment session can follow in a timely manner. If six weeks elapse between the first student doing the work and the assessment process the students will have forgotten what it was all about. Work done as part of a 'circussed' set of exercises is therefore not suitable as the first group cannot be assessed as soon as they have completed the task (or they will pass the answers on to others) and it may be several weeks before all students have done all the tasks, without getting any feedback on their performance.

The task set needs to change from year to year. If an identical task is set each year the marking schedules will get passed on and while student performance might improve year on year this is only because they are copying out last year's marking schedule. I currently have a set of three versions of each exercise which I rotate each year and have not yet any evidence that the material gets passed on. I have had instances where students handed in a write-up based on *last* year's exercise data and then complained that I had not warned them that the exercise was different year on year!

👤 TROUBLESHOOTING

Don't think your students are going to enjoy peer-assessment! Many believe assessment is the job of the teacher ("don't you get paid for this?"), many complain that peer-assessment is hard work ("you have to think and make judgements"), and that it's tiring ("I'm really bushed at the end of a marking session"). Some find it difficult to concentrate for a whole hour. Some believe student markers are unfair or inaccurate. The reasons for introducing peer- or self-marking need to be explained to students if it is to be introduced without resentment. See Figure 1 for documentation that has been used effectively in preparing students.

Silence in class during the marking process is imperative. Otherwise students will miss your explanations, ask for repetitions or misunderstand what was required and the marking session will take forever. In an ideal world, it might be possible to allow or encourage students to discuss and compare what is written in the material they are marking; but when I have tried this, the time taken was greatly prolonged and while some students were bored, others demanded more time. Not a good idea in practice; unless there is only a small amount of material to mark and no absolute deadline to complete the process by.

Figure 1. Part of a document used in preparing students for peer-marking, explaining the benefits to them

Student Guide to Peer-Assessment of Practicals

Why are we doing this?

You should get several things out of this method of assessment which may be new to you:

1. It is an open marking system; therefore you can see what was required and how to improve your work.

2. You see mistakes others make and therefore can avoid them; you also see the standard achieved by others and can set your own work in the spectrum of marks.

3. You get a full explanation of the practical and how you should have processed the data and done the discussion. Therefore your information and understanding is improved.

4. You get practise in assessing others and their work. You will need this skill quite early in a career and you will need to come to terms with the problem of bias; someone who is a good friend may have done poor work; it can be disturbing to have to give them a poor mark.

5. In assessing others you should acquire the ability to stand back from your own work and assess that as well. This is an essential ability in a scientist; an unbiased and objective assessment of the standards you have achieved in your own work. Once you are away from the teacher/pupil relationship (i.e. leave university) you will be the person who decides if a piece of work is good enough to be considered as finished and passed to your boss.

The method of marking adopted in this module is designed with the above factors in mind.

DOES IT WORK?

The published evidence (Hughes, 1995 and 2001) indicates the students on average produced better write-ups when using peer-assessment than they did when staff marking was used. The data demonstrate that this is not due to students being easier markers.

Peer-assessment saves an enormous amount of staff time, provides excellent feedback and achieves many of the points bulleted above. Marking accuracy is often queried but students can always check their mark against their copy of the marking schedule and appeal to the tutor if they are dissatisfied. To test reproducibility of marking three copies of the same practical were peer-marked independently by students as part of the normal marking session. The marks awarded differed by only 3% demonstrating the consistency of the marking process. In addition, I have, using the same marking schedule, personally marked several samples of peer-marked work. In every case the discrepancy was less than 5%. Confidence can be placed in peer-generated marks which can therefore be used as part of the marks which contribute to final module grades. External examiners have not objected to the use of peer-assessed marks in this way.

Several colleagues have started to utilize this method and no new problems or difficulties have been encountered.

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:

- an explicit peer-marking schedule;

- peer-assessment of oral presentations.

Writing and reviewing an article for a scientific magazine — a peer/self-assessment exercise

ROB REED

BACKGROUND AND RATIONALE

This exercise forms part of a second year module in research methods and scientific communication, taught to classes of 60–90 bioscience students. Students can find such topics rather dry and, as a result, the taught sessions rely heavily on workbooks and worksheets to cover the syllabus, which includes: locating and evaluating sources; primary and secondary literature; style and layout; the peer review system and its role in scientific publication; citation and referencing. The assignment requires students to apply the knowledge they have gained in the taught sessions to a short exercise, to satisfy the following learning outcomes:

- Use relevant methods to locate and interpret research information in the primary scientific literature.

- Use appropriate forms of scientific communication, in this module and in other modules within the programme.

'HOW TO DO IT'

The following steps describe the principal stages:

1. Having come to appreciate the difference between a primary and secondary source in the workshop sessions, students are instructed to select an interesting, recent paper from the primary scientific literature (published within the last few months, to avoid any possibility of plagiarism from previous years). Each student selects a different article (a sign-up sheet on the notice board enables students to check which papers have been selected and rewards those students who get off to a quick start!).

2. Students make a photocopy or printout of the paper: this is needed by their peer reviewer and must also be handed in along with their assignment.

3. Each student then prepares a brief article (400–500 words) about their chosen paper in the style of the 'This Week' section of *New Scientist* magazine. Students are told that their article should conform in general style and approach to the examples found in any copy of *New Scientist* (examples are also available from the website: http://www.newscientist.com) and they are given other guidance on layout (e.g. typed double-spaced, 12 point font, to include a word count, a full citation of the primary source is required, etc.).

4. Pairs of students then exchange articles and review each other's work, using an evaluation sheet very similar in overall style to that used by scientific journals. The reviewer must assess the article and (i) decide whether the article is acceptable without change or whether minor/major revision is required (ii) provide specific feedback on any points raised, e.g. by writing comments on the article, or as a numbered sequence, cross-referenced against the article. The reviewer is also given a copy of the original article, so he/she can see whether there are any omissions, etc.

5. Student reviewers then return the article and evaluation sheet to the original author, who has then to consider their response to the review, using a response form. Students must decide whether to (i) modify their article, where they feel that the reviewer's comments are appropriate and (ii) prepare a written response to each of the points raised by the reviewer. In this way, they are given a hands-on introduction to a process similar to that used for peer review of a primary scientific article. Students are also encouraged to reflect on their own work (self-evaluation), especially if they feel that their reviewer has been "lightweight" in providing feedback.

6. Students must then hand in for final assessment (i) the photocopy/printout of the original paper (ii) a copy of their original (unreviewed) article (iii) a copy of their reviewed article along with the reviewer's comments and

evaluation sheet (iv) their response to the review/evaluation and (v) a copy of the final version of their article.

7. The exercise is then marked on the following basis.

- The quality of the original (unreviewed) version of the article, as an exercise in presenting key information from the original paper in an appropriate and accessible style, with due regard for the target audience (general readership of *New Scientist* magazine) — 30% of the overall mark.

- The student's response to peer review (and/or self-evaluation), as evidenced by (i) the changes made to the original version in producing the final version and (ii) the response sheet, dealing with reviewer's comments — 30% of the overall mark.

- The student's effectiveness as a peer reviewer, based on (i) written comments on their partner's article and (ii) the evaluation sheet of their partner's article — 40% of the overall mark.

ADVICE ON USING THIS APPROACH

It is essential that students are given clear instructions in writing at the outset of the exercise, to support the oral explanation given during the class. I have found it necessary to provide quite detailed guidance (for example, many students didn't understand the concept of double-spacing, thinking that this meant having two spaces between each word!). The guidelines now explain that a space equivalent to two lines is needed in the printed version to give sufficient room for the reviewer to provide hand-written comments, along with step-wise instructions on how to set up MS Word to provide double-spaced text). I have also found it useful to provide the students with a detailed checklist of all of the items required for submission, since it can be a little confusing (they have to realise, for example, that their work as a reviewer will be handed in by their partner, and that I will separately assess this aspect of their work, and then collate the marks).

It can sometimes be a little difficult keeping track of which students are working together — I ask them to sign up in pairs at the outset, and not to switch partners without informing me. I allow them to select their own partners, and I tell them that they should not regard this in any way as a "soft option", since I will have oversight of the whole process, and

that students who simply give their partner an undeservedly positive review will score poorly in that aspect of the exercise!

TROUBLESHOOTING

Sometimes students will work in threes, rather than pairs — in such instances, each person reviews the work of a different person to their own reviewer. It works just as well this way, and is an alternative approach, avoiding reciprocal peer-assessment.

In occasional instances, there is a problem with one of the team members (e.g. where a student does not return the reviewed article by the specified date, or where someone is ill during the programme) — such cases have been dealt with on an individual basis by either (ii) reassigning group members or (ii) asking one student to perform a second (unassessed) review, so that all elements of the process are covered.

It can be a little tricky marking the various aspects of different people's work at different times — my approach has been to mark the review (second person's mark) at the same time as the original and final versions of the article (first person's mark) to ensure continuity in reading the article, and to use a pre-printed feedback sheet with a number of general comments to provide overall feedback, as well as a mark for each component. This structured approach works well with a large group of students.

DOES IT WORK?

Student feedback is usually positive for this aspect of the programme — students generally regard it as an interesting exercise, and a welcome change from more traditional essays and similar written assignments.

FURTHER DEVELOPMENTS

It has run successfully in its present form for the past five years. To date, the peer/self-assessment component has been restricted to a broad overall evaluation, based on written feedback, rather than a quantitative numerical mark/grade. One aspect that could be introduced relatively easily would be to ask students to provide a numerical mark for each of the aspects of the process (e.g. self-assessment of (i) the original article and (ii) the final article, and (iii) peer-assessment of their partner's article. Students would then be able to compare their own assessment marks with those of the lecturer, to see how effectively they can assess their own work and that of others, using the same criteria as those of the teaching staff.

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:

- student assignment;

- assignment front sheet;

- peer reviewer's evaluation sheet; and

- author's response to peer reviewer's comment.

7

Peer-assessed problem-based case studies

CHARLES BRENNAN, ELIZABETH FOLLAND, RICK PRESTON & NICOLA BLATCHFORD

BACKGROUND AND RATIONALE

Final Year Food Technology students participate in a real-life problem-based case study. Each case study focuses on a small problem within a larger graduate research project being undertaken by the university with an industrial partner. As such, the project tends to be a blend of the practical use of food technology pilot plant equipment and background theoretical research. Students are allowed to organise their work pattern in order to meet the objectives of the particular project.

The final assessment of the case study is as a group, conference-style, oral presentation. These presentations are exclusively peer-assessed. Time is taken within the module to discuss and devise appropriate marking strategies and descriptors. Thus the students take ownership not only over their working time but also in the style of assessment strategy, giving them greater understanding of learning patterns.

'HOW TO DO IT'

During the final week of research activity, students are reminded about the mini-conference presentations which are required as their assessment of the case study. Guidance is given on presentation techniques and the use of graphics and IT in presenting information using MS PowerPoint. Examples of previous conference presentations are provided as a benchmark. At the same time, the marking strategy is discussed and the elements of presentation to be assessed, together with the balance of marks associated with each element, are agreed within the group. This process is mediated by the academic; however the students lead the discussion and formulate the marking criteria.

On the day of the student presentations, evaluation sheets are distributed amongst the group and the process of peer-assessment is reinforced. The presentation evaluation sheets are graded on a scale 1–9 using the criteria already agreed on. A total of 10 criteria relating to both product and process are used, such as relevance of information supplied, evidence of sound laboratory practice, evidence of teamwork, timekeeping, readability of slides and amount of information supplied.

Students are then expected to evaluate each groups' performance (according to the criteria already laid down), and any additional information about a groups' performance is noted on the evaluation form. At the end of the series of presentations, all evaluation sheets are collected in by the academic. Evaluation sheets obtained in this exercise are then scrutinised by the academic and the marks allocated to each group (for every element of the assessment) are fed into a database. The final mark for each specific element of the exercise is given as the mean awarded to the group by their peers, and the overall mark is derived according to the marking criteria as agreed by the students.

Follow-up workshops are used to disseminate good practice to students and to evaluate student perception of the process.

TIPS/THINGS TO LOOK OUT FOR

Staff need to be willing to explain (openly) how and why student assessment criteria are set. This facilitates the students' understanding of developing their own marking criteria and leads into the idea of peer-assessment. Sometimes the actual idea of peer-assessment is so strange to the students that additional time needs to be spent in reassuring them of the fairness of such schemes, and the importance of treating the process professionally.

❓ DOES IT WORK?

The use of peer-assessment in this case study benefits the students. Although there may be a slight reluctance to use peer-assessment for the assignment initially (sometimes students express a wish that the assignment is evaluated by academics, following usual guidelines). However, the students do accept their roles in the assessment procedure and act responsibly. Through completing the assessment they do learn how to reflect on the work of their peers, how to assess and evaluate work separate from personal friendships, and how to accept positive criticisms regarding the quality of their own work. Indeed, it is interesting that the process also allows the students to reflect on their own learning styles and choices of appropriate communication tools.

As such the case study is extremely useful in developing critical evaluation of their own compositions, and a greater autonomy over their working practices. This development of self-evaluation, and self-worth, is noteworthy when you also take into account the students' greater awareness of the use of their skills and knowledge acquired so far, in problem-solving real-life situations.

🔧 FURTHER DEVELOPMENTS

Further developments may be to devise workshops specifically aimed at introducing the principles and aims of peer-assessment. This would have the advantage of reducing student reluctance to participate in such exercises, and also help with their understanding of assessment marking strategies. A result of such could be their ability to better manage their own assessment achievements in modules.