

## 6

# 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 handwritten 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.

## '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.

# 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.