



Linking Teaching with Research in the Disciplines

Case studies for Courses and Course teams

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

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Classification Category:

- Development of student research skills
 - Using assignments which involve elements of research processes
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Context:

- **Course/unit/module title: Research Methods and Scientific Communication**
 - **Level: 2**
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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:

1. Use relevant methods to locate and interpret research information in the primary scientific literature.
2. 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 should select 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.
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Hot tips and things to look out for:

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 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!

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.

What problems/issues have arisen?

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 (i) 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.

Details of support material: *Student assignment sheet and review forms are copied below.*

Literature-Based scientific communication assignment (R H Reed):

- 1 Select an appropriate, current paper (published in the last few months) from the primary scientific literature. Choose something interesting, but don't opt for the same paper as your friends – there are thousands of papers to choose from, so make sure it is a suitable topic for an article in a scientific magazine.
- 2 Make a single photocopy of your selected article (you'll need to hand in this photocopy later in the module, as part of the assignment and you'll find it easier to work with a photocopy than with the original journal).
- 3 Prepare a brief article, in the style of the 'This Week' section of 'New Scientist' - your article must be 400-500 words . *Include a word count at the end.* The article should conform in title, general style, & approach to the examples found in any copy of New Scientist – the major difference is that you need to give full citation of your source. Your article should be typed (word-processed) double-spaced (i.e. *two 'line spaces' between each row of text* – you'll find the Word™ command under "Format" "Paragraph" "line spacing") & it should be no more than two A4 pages long.
- 4 Identify another student who you can work with in the second part of this exercise, which involves 'peer reviewing' each other's work (NB: in some cases, it may be necessary to have 3 per group, but two is simpler).
- 5 Exchange your article and the photocopy of the original paper with your 'partner', who will (i) read your article, (ii) read the original paper, (iii) make any *specific* suggestions for changes or corrections to the text of your article, by writing directly on one of the copies (iv) complete a short evaluation of the article, giving *general* feedback and *specific* comments (using the 'peer reviewer's evaluation sheet' provided).
- 6 You will then consider your response to this 'peer review', during which time you can (i) modify your article as and where you feel this is appropriate (you should also re-read your own article, to see whether you can improve on any aspect) and (ii) prepare a written response to your partner's evaluation of your original article (using the 'response sheet' provided).
- 7 When handing in your work, make sure you hand in all of the items listed on the checklist inside a single plastic wallet (so they don't go astray).

Assignment Front Sheet

Research Methods

Literature-based Scientific Communication Assignment

Student's Name (author).....

Title of your article

.....

Name of your reviewer.....

Date

[NB You don't need to give the names of the authors and the title of the original scientific paper on this sheet !]

For this assignment ALL of the following items should be submitted inside a **SINGLE PLASTIC WALLET**.

Use this checklist to confirm that all items are provided, and numbered in the sequence given below (tick each box):

- **1. This front sheet, as the first page.**

- 2. The **photocopy of the primary scientific paper** you used to prepare the article.

- 3. A single copy of **your original article (marked "ORIGINAL VERSION")**

- 4. The second (reviewed) copy of your original **article, with the peer reviewer's written comments** on it.

- 5. The **reviewer's evaluation sheet**, giving the reviewer's feedback comments and evaluation of your article.

- 6. **Your response** to the reviewer's comments (**author's response sheet**).

- 7. A single copy of **your revised article (marked "FINAL VERSION")**.

Peer Reviewer's Evaluation Sheet

Reviewer's name

Author of article

Title of article

Overall assessment (circle the appropriate number in the list below):

- 1. Acceptable without modification
- 2. Acceptable with minor modifications
- 3. Acceptable only after substantial changes
- 4. Unacceptable – requires complete revision, or an alternative choice of topic

Evaluation: *Your task is to consider the quality of the article, in terms of how well it uses the information from the original primary scientific paper and how effective it is as an example of scientific communication (in terms of content and style), including the broader aspects of the work used as the basis of the article. Your comments should justify your overall assessment of the article.. Use a continuation sheet , if necessary.*

Note that the reviewer should also make specific comments (e.g. in red pen) on the original article – e.g. to correct minor errors, or to provide numbers for cross-referencing against the evaluation below. (**continue overleaf, if necessary**):

Author's Response to Peer Reviewer's Comments

Author's name

Reviewer's name.....

Title of article

Write a commentary in the space below, giving SPECIFIC details of your responses to each of the peer reviewer's comments, explaining whether you have modified the original article in response to the comment, or whether you have rejected the comment (and why).

(Continue overleaf, if necessary):