

# CHALLENGES FOR STUDENTS IN THE TRANSITION TO COMMUNICATING AS BIOLOGISTS

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## Context

Using the scientific literature and communicating scientific research findings are essential components of undergraduate degree programs (Brownall et al 2013), and we have integrated academic writing and peer review into the biology curriculum since 1992. More recently the use of independent student inquiry activities has required us to focus on introducing students to the use of the primary literature (Healey and Jenkins 2009, Moscovitz and Kellogg 2011). First year students now engage with novel research experiments in laboratory courses, where they work with experimental design, data collection and interpretation, and reporting in the format of a journal article. As part of this process we expect them to access, read and incorporate information from the primary research literature into their report. Support for writing and reflection is incorporated through peer review sessions where students can give and receive feedback for further improvement of their writing.

## Problems

Students struggle with searching for, and reading, the relevant literature, extracting information from research articles and identifying key conclusions (van Lacum et al 2012). Most students remain confused by this novel environment and we predict that lack of engagement with the literature leads to poor outcomes in report writing. The concept of paraphrasing and its relationship with a conceptual understanding of the journal text also remains a challenge for most students (Pittam et al 2009) and is reflected in ongoing issues around potential plagiarism. Meanwhile the peer review process leads to many misunderstandings as students expect one-to-one teacher feedback and cannot develop the independence or confidence to help others, while reflecting on their own work (Orsmond and Merry 2013, Nicol et al 2014).

## Methodology and Results

Students in two first semester units of study (n=2500) were asked to provide access to their draft and final laboratory reports. Quantitative data included draft and final report marks, and the reports were subjected to a phenomenographical analysis to determine variation in the following items: a) extent and quality of text changes between draft and final reports, b) relationship between report marks, final grades and use of the primary literature c) use of the literature to develop scientific arguments. In addition, staff who teach in the units, and mark the drafts and reports, were interviewed to discuss key issues in the peer review and online marking processes.

Preliminary results indicate that while a sub-set of students are able to identify appropriate research studies to cite in their own writing, can effectively paraphrase information and develop arguments to place their experimental results in a broader research context, many students find it difficult to recognize appropriate papers to use in their writing, cannot identify the relevant information and therefore struggle with the writing process. The two groups approach the peer review process with different expectations and their learning can be further impeded by an inability to reflect on their own writing and make subsequent improvements.

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