DRIVING STUDENTS TOWARDS THEIR BEST – AN INTEGRATED APPROACH TO SCIENCE REPORTS

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Background
The ability to accurately and logically write up experimental findings in report form is considered to be an essential skill for working scientists (Office of the Chief Scientist, 2014; Robertson, 2011), yet it is a skill that many students find difficult to master. Thus, finding ways to enhance the scientific literacy of science students has become a focus at many universities (e.g. Brownell et al., 2013; Coil et al., 2010; Gopen and Swan, 1990; Lee, 2013; Quitamano and Kurtz, 2007). However, many instructors report that students often resist engaging with supplementary help resources, or do not provide adequate drafts for feedback (Manske, 2010; Sturridge, 2013). Consequently, many students often aim for ‘satisfactory’ rather than ‘excellent’ in such written assignments – a position that is usually in direct opposition to that of their instructors.

Aims
Here we report on an integrated approach that aimed to:
(i) better engage Diploma level tertiary science students in the scientific report writing process, and
(ii) encourage students to write reports of a high (rather than a satisfactory) standard.

Design and methods
Short written activities were embedded before, during and after a practical laboratory exercise that later formed the basis of a longer, more formal scientific report.

Students were required to conduct preliminary research prior to attending a practical laboratory class at James Cook University, Queensland. Students collected experimental data in a laboratory, and reported their methods, discussions and conclusions in short answer form. Students received formative feedback on their laboratory work from peers and lecturers and the revised work was then directly incorporated into a formal report framework. The students then expanded on this work and submitted it as a formal, 1500 word scientific report, worth 25% of their overall grade.

To encourage students to aim for a high level of work, a minimum grade of Distinction (75%) was necessary in order for them to receive a grade for the assignment. Students who received less than 75% were not given a grade but were permitted to resubmit their reports on the proviso that they:
(i) attended a 15-minute consultation to discuss their report submission, and
(ii) submitted a written paragraph outlining how they had responded to feedback on their original report.

Results
The quality of work submitted was greatly improved on previous semesters where students were asked to submit a draft for grading and feedback prior to submitting their final scientific report. Student engagement with online help resources was also much higher. Whilst marking time was substantially increased for the first report submission in comparison with drafts marked in previous semesters, marking time for the final report was greatly reduced.
Abstracts

Conclusions
Setting a high initial grading standard for students, withholding less than excellent ‘draft’ grades and integrating a stepwise writing approach to science report writing resulted in significantly higher student grades and resource interaction than previous, more traditional approaches.

References