

Case Study: Implementing Active Self-Feedback in Teaching

Bernard Treves Brown, Chemical Engineering

Course information

In their second year, Chemical Engineering students on both the BEng and MEng programmes complete the mandatory Laboratory Projects course unit, which takes place across the entire year. The unit is co-ordinated in part by Bernard Treves Brown, a Senior Lecturer in Chemical Engineering, who incorporated active self-feedback into this unit to help students write lab reports and adjust to the higher standards of second year.

Across the year, students are expected to produce six lab reports, which are equally weighted and contribute to 90% of the summative grade of the unit. However, their first lab project of second year, completed in small groups, is submitted for formative assessment, rather than summative. The expectations for second year lab reports increase sharply from first year lab reports, which are essentially forms with sections to be filled out. In second year, lab reports are expected to adopt a more formal, academic style. Historically, it has been a challenge for students to adjust to this change and adopt the desired academic format.

For a second year report, the idea is that students should include the content that they learned to write in first year but write in a more natural style. For example, students should discuss their results and the factors affecting them as they present them, rather than having a section of graphs presenting the results, followed by a section discussing the results, and another presenting the error sources that might have affected the results.

This implementation of active self-feedback, as part of a formative exercise, was intended as an alternative to a session where the new expectations for a second year reports were merely explained to students. With this approach, by the time students come to write the reports which will be summatively assessed, they have already had a go at writing something approaching a second year lab report. Furthermore, they have generated some feedback for themselves before receiving detailed feedback from a teacher on both their report and self-feedback. This is intended to be a more effective way to prepare students and make them aware of expectations for their summatively assessed reports.

The task

Students complete their first second year lab project in groups over two days and write a lab report as a group. This is formative, but the same system is used for summative two day experiments. The project can be any of the experiments that we run in second year. Students are also provided with two reports from past years' experiments as

comparators. The marking rubric has eight sections and students are asked to complete a form generating self-feedback under each of these headings and append it to their report (for this formative report only). The feedback template can be found below.

Each group then has a one hour meeting with a teacher to go through the project and receive detailed feedback, and to discuss their self-feedback. Most of the session is spent going through the students' report and explaining the expectations for a second year report. Students are then asked how well they think their self-feedback fits with the feedback they have received directly from their teacher. Any additional time in the session is spent discussing how students used the exemplars.

Comparators

Students are given two past student reports from experiments that are no longer run, with marks and feedback. The reports are of different quality, with marks of 67% and 52%. Ideally, the comparators would include a report of higher quality, but one was not available for these older experiments.

Reflections by teaching staff

The main obstacle for this activity was student engagement. The value of self-feedback is explained to students, but the activity remains formative rather than summative. Despite this, there was a general sense that students understanding of expectations improved this year.

Reflections by students

The students who commented have suggested that it is a useful reinforcement of the mark scheme and hence the different expectations for second year reports. This matches the intentions of the task, where the headings of the self-feedback exercise matched the mark scheme.

Appendix: Worksheet

Feedback on a long report

Technical – Introduction and Context: including abstract, introductory statements, motivation, objectives, theory and relevance (10 marks)	
Technical – Description of core work, equipment used and hazards (15 marks)	
Technical – Results including observed data and derived results and calculations and error analysis (20 marks)	
Technical – Conclusions including interpretation of results, comparison with literature/theory and limitations plus answers to any questions asked in instructions (15 marks)	
Style – Structure including brief abstract (10 marks)	
Style – Notation (5 marks)	
Style – Data presentation (20 marks)	
Style – References (5 marks)	