

Providing focused feedback to individuals in large classes of first year undergraduates

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Abstract

Large cohorts of students present specific problems in relation to assessment and feedback. Engaging in any kind of dialogue with individual students is difficult to manage, as is creating an effective formative learning programme which they are happy to engage with. A learning programme for first year bioscience undergraduates in their first semester is presented which addresses many issues essential to a successful formative programme: that students must want to do it, that it must feed forward and that there must be place for a dialogue. Students completed and had marked and returned a first formative practical report. They received corrections but no mark. They then had a process of reflection on this piece, which fed into a second formative report, allowing feedback which focused on the individual needs of each student. After receiving feedback from this, and a rough indication of a mark, they completed a draft of the summative piece which went through a process of peer review before a final version was handed in. Over 70 % of the students engaged with the whole formative programme. The mean mark for the summative piece at the end of the semester was significantly higher ($p < 0.001$) for those who had engaged with all formative tasks relative to students who had not fully engaged. Students appreciated the formative tasks. They were supported in their learning through a process which they found particularly difficult, that of writing full scientific reports, using primary literature to write well structured introductions and critical discussions, correctly citing sources, as well as formatting methods and results sections correctly.

Keywords

Assessment, formative, practical reports, first year, feed forward, reflection

1. Introduction

Feedback to coursework is a process that has been extensively covered in the literature (Shute, 2008). There is general agreement that feedback should be timely, being able to feed forward into other pieces (Higgins et al, 2002) and assignments must have a clear purpose (Rae & Cochrane, 2008). Nicol and Macfarlane (2006) described seven principles of good feedback which included students' need to reflect on their own learning and that there should be a dialogue between the teacher, the student and their peers. They also point out that the feedback process may also provide teachers with useful feedback to shape future teaching.

The main purpose of formative feedback should be to enhance student learning and skills (Shute, 2008). She argues that the value they get from this formative feedback is governed by an appreciation of why they need to do the work, that the work is set and returned at times which are appropriate and that students are able and willing to do it. Feedback also needs to be part of a process whereby students move from being told how to improve to a process of self-monitoring (Sadler, 1998). To do this, students need to know what constitutes a good assignment and where they are able to show originality. They also need to be given the opportunity to reflect on their feedback (Sargeant et al, 2009).

One of the biggest problems in university teaching is providing good quality feedback to large classes of students, and particularly those in their first year where the learning curve is so steep and class sizes at their largest. In addition, the introduction of blind marking in many HEIs has removed the opportunity for individual and personalized feedback, known to be valuable to students (Higgins et al, 2002). Rae and Cochrane (2008) suggest teachers invite students to engage with them in a dialogue about their feedback, but this is extremely difficult if class sizes are large. The work to be presented shows a formative programme of learning which addresses the above points and makes personalized, timely and focused feedback possible in large first year classes.

2. Methodology: assessment and feedback process

This study focused on a group of 116 first year biosciences undergraduates in their first semester. At the end of the semester they were required to submit a summative practical laboratory report. Prior to this they undertook a programme of formative assessments. In their second week students completed a short practical experiment. They were given a lecture on how the write up should be formatted and how this differed from write ups they would have done prior to coming to university. They received feedback on this report and then completed a second practical experiment and report. When handing this in they were asked to complete a form which asked three questions:

1. Which parts of your report do you feel have improved the most following the feedback from the ciliate [first] report?
2. Looking at the marking guidelines in the student handbook, what mark range do you feel your report fits into?
3. What specifically would you value feedback on to enable you to aim for a higher mark category?

They had this report marked and returned to them. They then designed their own experiment based on the behavior of a range of arthropods. They wrote up the report and brought it along to a peer review session where they had to review two of their peers' reports. They were given a form to complete with questions relating to each section of the report. They were also allowed to write comments on the scripts. Following this they were given one week to correct their own scripts in the light of the peer review comments and then hand in the report which was a summative assessment.

Data was collected on the number of students who completed each formative task and the mark given for the final summative piece. Students were asked to reply to a few questions about their reactions to the formative programme.

3. Results and discussion

The majority of students (70.7%) completed the whole formative programme and the average mark for those engaging with the whole process was significantly higher ($p < 0.001$) than for those who engaged with two or fewer pieces (Figure 1). It did not matter which of the formative pieces the student missed, the difference was seen only for students who completed all three formative exercises, with students who missed any of the three assignments achieving the same mean mark as those who missed more than one assignment.

| NUMBER OF FORMATIVE EXERCISES ENGAGED WITH | % STUDENTS (N=116) | MEAN MARK \pm S.E. FOR SUMMATIVE ASSIGNMENT (%) |
|--|--------------------|---|
| 0 | 1.7 | 58.5 \pm 6.5 |
| 1 | 2.6 | 60.1 \pm 2.5 |
| 2 | 25.0 | 59.6 \pm 1.4 |
| 3 | 70.7 | 66.3 \pm 0.8 |

Figure 1: Percentage of students engaging with the formative exercises and the mean mark achieved for the summative piece.

While this programme of formative feedback did involve marking two scripts from each student and then the final summative piece over the course of one semester, the value to the students was far greater than these individual pieces of feedback. This is because the feedback was integrated into a learning programme. Students were asked whether they appreciated the number of formative assignments before they handed in the summative report, or would they have preferred some of the formative pieces to be summative. A couple of examples of the feedback from students were:

“Found the several formative reports essential for determining the correct formatting of figures, references and sections of the report. Given that Biodiversity was the first module which required write ups (and i had never experienced this format at A-level or prior) this seems to be arguably one of the most important things learned this year.”

“The volume of formative assignments was great - None of us really had any experience of writing reports before so the formative work really helped us get to grips with the new style of writing. By the time it came to the summative piece of work I was very comfortable with what was expected of me and I knew exactly how to go about writing it.”

One of the main problems with marking the scripts of a large cohort of students is providing individualized feedback. It would be exceptionally time consuming to keep a record of each student’s progress. In this programme students filled in a form which they handed in with their second formative script. Below are two examples of completed forms.

Which parts of your report do you feel have improved the most following the feedback from the ciliate report?

Student 1. “more concise, finding better references and being better at structuring some parts of the report.”

Student 2. “I think my referencing has improved most but still need some adjustments. Also my technical errors are less so in this piece.”

Looking at the marking guidelines in the student handbook, what mark range do you feel your report fits into?

Student 1. “Lower ii/ii”

Student 2. “Either lower II-upper II (50-60%)”

What specifically would you value feedback on to enable you to aim for a higher mark category?

Student 1. "I'm really confused about how to write the discussion, I don't seem to know what to put into it."

Student 2. "How to write better introductions and what to include in results sections where no stats are currently used."

One of Nicol and Macfarlane-Dick's seven principles of good feedback is to encourage a dialog between teacher and student. Higgins et al (2002) and Rae & Cochrane (2008) also stress the need for individual, personalized feedback and a dialogue about the feedback. In this programme feedback provided to each student focused on specific areas they individually felt they needed help with. Students were asked whether they found it useful to fill in this form. Some examples of feedback from the students were:

"To me it made a big difference as it gave me a chance to reflect on my own work and also gain more specific feedback on my weakest areas so to improve more. Extra feedback is always worth it, even if it means directing the feedback in a certain way."

"The feedback was useful as it was possible to gain a more in depth 'dialogue' than is possible in regular marking feedback. From this I was able to gain advice on how I can improve my writing style."

"I found this process a useful self reflection period, allowing me to focus on specific areas that I was struggling with."

This demonstrates the reflective power of this process, highlighted as a key part of the feedback loop (Sargeant et al, 2009). Getting students to reflect on their feedback and think ahead to the next piece of feedback they receive appears to be extremely valuable to the students. Sargeant et al (2009) suggest that the reflection process also assists with their emotional responses and concerns about the feedback. Sadler (1989) suggests it is useful to know something about the aspirations of the student. This is addressed in asking students to suggest what mark they believe their second formative piece would achieve. It allowed for feedback on each student's perceptions of their work and also resulted in an active engagement with the marking criteria.

Before handing in the summative assignment students engaged with a peer review exercise on a draft of this work. When students engage with the peer review process, it assists with the development of critical skills. It helps students progress from receiving feedback to engaging more critically with the process and towards self monitoring, which Sadler (1989) highlights as important. Students' perceptions of the benefits of this exercise however, were mixed. This is almost certainly due to the effort their fellow students put into correcting their scripts. Students were asked which was more helpful, seeing what others had written or receiving comments on their own script:

“Receiving comments on my script, however I do feel that the feedback may not have been quite as constructive as I had originally hoped- I got the feeling that my marker had skimmed through mine and not fully read it... if that makes any sense at all.”

“Yes, I found seeing what others had written and their take on the same questions was useful. It also helped to remind me what was not right in both other people's and my own script.”

“I found it very beneficial to read over other people's scripts and provide feedback as it helped to reaffirm what I had learnt about report writing. It irritated me slightly that feedback that other people had left off my script was giving me advice that was contrary to what we had been taught, but I suppose one of the points of the exercise was to highlight how differently everyone approaches report writing.”

Students were asked whether they used the feedback on their formative pieces to help them write the summative report. Some examples of the replies were:

“I gathered all the feedback from each formative/previous report and made a 'check list' which i still apply to every report I submit, adding to it with subsequent feedback. I have found this immensely useful.”

“The feedback did help me, as it showed me what I had been doing wrong. Not only did it help with the arthropod [summative] report but also all the other reports that I have written since.”

“Yes! I had my formative pieces out in front of me when reading through my final arthropod report, allowing me to critique myself through the previous comments I had received.”

The formative programme outlined here addresses many of the key components of good practice in assessment and feedback, and more specifically makes this possible for large cohorts of students. Shute (2008) says that students must know why they need to do a piece of formative work. In this programme all the formative work is not only directed at a high value piece of summative work, but also directed to their general development as scientists. Feedback needs to feed forward, and this programme feeds forward at every stage. Getting students to reflect on their learning is one of Nicol & Macfarlane-Dick's seven principles of good feedback practice and the reflective elements in this feedback programme directly address that issue. They also say that to get a dialogue between student and teacher is very hard in large classes, but this programme provides a framework for dialogue. Sadler (1989) also suggests students need to develop from feedback to self monitoring, a key point relating to the need for students to become independent learners. Development of this skill needs to begin straight away in an undergraduate programme. The self reflection aspect of this programme helps with this, as does the peer review which helps them develop critical skills to then apply to their own work. This learning programme helps personalize feedback to large cohorts of students and engages them with formative assessment.

4. References

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