



Strategies, Methods and Contexts

Valentina Grion • Anna Serbati
[editors]

Assessment of learning or assessment *for* learning?

Towards a culture
of sustainable assessment in higher education

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V.

Unlocking generative feedback through peer reviewing

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<https://youtu.be/NRPvkz33XFg>

Introduction

When one thinks about feedback in the context of higher education, the first image that comes to mind is a teacher writing comments on students' assignments. These comments tell the students about the strengths and weaknesses in their work as well as giving suggestions about how that work might be improved. The assumption is that students will read the comments, process them and then update their knowledge about the assignment they have just produced; and that they will also transfer this new knowledge to inform future works. Despite the widespread but usually tacit acceptance of this transmission conceptualisation, there is little published evidence that students do learn much from the mere act of reading feedback comments from teachers, or that they transfer such feedback in ways that improve their production of new works (Sadler, 2010). Indeed, there is even research evidence of students failing to learn despite receiving good quality teacher feedback (e.g. Crisp, 2007). Furthermore, it is also a common experience that learning still occurs in situations where there is no teacher feedback. Indeed, in some countries, such as Italy, teacher-feedback is not a mandated course requirement and students still seem to learn, even as well as UK students. Hence, it would appear from such observations, and from the available

research, that feedback from an ‘external’ source is not a necessary condition for student learning.

Feedback as communication process or a dialogue

Over the last twenty-five years, due to lack of research demonstrating learning gains from feedback delivery, and because of some landmark educational papers arguing against the transmission conception (e.g. Barr and Tagg, 1995), there has been a movement away from this conception of feedback. Researchers now maintain, and there is research evidence to show, that to learn from feedback, students must actively do something with externally-delivered information. Just as you cannot learn to play tennis merely by listening to the coach, so it is argued you cannot learn to produce better essays or to become better at solving problems just by listening to the teacher’s advice or by reading the comments that they write on your submitted assignments.

Based on this idea – that the quality of the students’ interaction with delivered feedback is as important as the quality of the transmitted message – researchers have begun to reconceptualise the feedback process. Winstone, Nash, Parker and Rowntree (2016), for example, view feedback as a ‘two-way communication process’ rather than a one-way process from teacher to student. Consistent with this view, these researchers outline a range of what they call ‘recipience’ activities, things that students must do if they are to learn from externally-provided feedback. In turn, Liu and Carless (2006) and Nicol (2010) argue that teachers have been treating feedback as if it were a monologue when, in reality, it is a dialogue – a discursive, adaptive, interactive and reflective process. Hence, they make the case for more opportunities for feedback dialogue in the curriculum, for example, for students to discuss their work and the feedback they receive with peers and with their teachers.

While the communication and dialogue conceptions represent an evolution in thinking about feedback and go beyond the transmission view, they are not without their own problems. One issue is that those who hold these conceptions still view

feedback as ‘external’ to the student, or at least as externally-driven rather than as an internal process. It is still assumed that in order to learn, students must make use of feedback information provided by others, and that these others are needed to decide what that information should be (Boud and Molloy, 2012). Moreover, the primary ‘other’ in such conceptions is more often than not the teacher. Indeed, the teacher’s input usually forms the basis for students’ ‘recipience’ activities or is the starting point or central focus for feedback dialogue. Hence, while conceptualizing feedback as two-way communication or as a dialogue appears to be a step forward, it might not go far enough, as it still assumes that agency for feedback is in others’ hands rather than in those of the students. So how might we more usefully conceptualise feedback processes?

Generative feedback: feedback as an inner process

In this article, the argument is that feedback should be conceptualised from a different perspective – not as transmission, nor as two-communication or as a dialogue, although it might be influenced by, and embedded in, such activities. Instead, feedback is seen as, at core, an ‘internal’ generative process through which students construct knowledge about their own ongoing activities and understanding through their own evaluative acts. This conception of feedback as internally generated contrasts with the prevalent idea of feedback as externally provided information. Although this idea is not new and has been proposed before (e.g. Bulter and Winne, 1995; Nicol and Macfarlane-Dick, 2006; Nicol, 2013) it has not so far occupied a central position in research nor, importantly, has it been used by teachers as a framework to think about and design feedback practices. One reason for this is, that being an internal process, its operations are tacit and hidden from view, and hence it is not clear how one would design for its productive activation. This article begins to address this issue.

So, what exactly do we mean by generative or inner feedback? And how might such inner feedback be productively harnessed? In answering the first question, the starting point is to recognise that inner feedback is ubiquitous. It occurs whenever

students engage in a learning task or produce a piece of academic work (e.g. an essay, a design, a report). It does not rely on teachers for its existence. Without such inner feedback, the behaviour of students would be random and unpredictable. As the by-product of task engagement, generative feedback derives from the students' inner monitoring and evaluation of discrepancies between current and intended performance, the latter determined by some mix of the students' own goals and what they think the teacher is looking for. As Butler and Winne (1995) state, inner feedback is the 'inherent catalyst' for all self-regulated activities - it is the raw material that learners must create if they are to regulate their own learning. It informs, generates and shapes learning engagement and learning progress. Moreover, research shows that those more effective at self-regulation, either generate more productive inner feedback, or are more able to use the feedback they generate to achieve their desired goals (Butler and Winne, 1995).

But where does inner feedback sit with regard to external feedback processes? External feedback, on its own, does not inform students *how* to self-regulate, although it can initiate self-regulatory processes. To inform learner-regulation and knowledge construction, students must turn external feedback into inner feedback. They must decode the external feedback message, internalize it and construct new knowledge from it. They must then compare and evaluate these inner constructions against the work they have produced (or more accurately a mental representation of that work) and generate feedback from that comparison. It is this inner feedback that leads to learning. In sum, using feedback provided by others always calls on evaluative acts by the students themselves, and such evaluative acts are what generate inner feedback. To add to the complexity, the inner feedback generated from external sources never operates alone, it merely adds to other ongoing learner-generated feedback, either confirming, supplementing or conflicting with it (Butler and Winne, 1995: Nicol and Macfarlane-Dick, 2006). As Andrade (2010) notes, 'students are the definitive source of all feedback' as it is they who ultimately generate it and it is this that generates learning. For the most part, research on feedback has not adequately addressed the complexity of these inner mental processes.

Given the centrality of inner feedback within self-regulatory processes, this article focuses not on how to improve external feedback but instead on how to productively harness and enhance inner feedback. One way of achieving this is through peer review, although it is important to recognize that this is not the only method.

Harnessing generative feedback

Peer review, as discussed in this article, refers to scenarios where students evaluate and make judgements about the work of their peers and construct a written feedback commentary (e.g. about the quality, value or success of that work). In peer review therefore, students both review and produce feedback on peers' works and receive feedback reviews from peers on their own work. Most research on peer review has focused on the benefits to students of receiving feedback from peers, or on the combined effects of producing and receiving feedback reviews, rather than on the learning that occurs through the act of reviewing (Liu and Carless, 2006; Cho and MacArthur, 2010; Topping, 1998; Falchikov, 2005). Another confounding factor in this research is that almost all studies before 2010 were about peer assessment rather than peer review, where the interest was not in the formative effects of feedback comments but instead on whether students awarded the same grade for the peers' works as that awarded by the teacher.

Recently, however, researchers have begun to investigate 'learning through reviewing' and how reviewing differs from receiving feedback reviews. This research shows that not only does reviewing on its own (i.e. without receiving peer feedback) improve learning (e.g. as shown by students' subsequent work on the same topic) but also that the learning gains from reviewing are often greater than from receiving reviews (e.g. Cho and MacArthur, 2011; Cho and Cho, 2011). A key issue in this research is what causes these learning gains.

Generative feedback in reviewing

In addressing this issue, Nicol, Thomson and Breslin (2014) using survey and focus groups asked first-year engineering students about their experiences of producing and receiving feedback reviews. In this investigation, all students produced a product design report and then reviewed the reports of two other students, using criteria provided by the teacher. The distribution of the reports was handled by software so that students did not know the person whose work they were reviewing. Also, students did not grade or mark others' reports, they merely identified weaknesses in relation to the criteria and suggested how these might be addressed.

Not surprisingly, these students perceived producing reviews as cognitively very demanding. They reported that reviewing called on them to think critically, to make judgements, to problem-solve (i.e. to diagnose weaknesses and suggest improvements in their peers' works), to take the role of the assessor and to apply criteria. This contrasted with what they wrote about receiving reviews, which was more about how feedback comments provided by peers alerted them to gaps or weaknesses in their own work. Overall students reported that reviewing was an active, constructive and knowledge-building learning process whereas receiving reviews was much more passive.

However, the most important finding from this qualitative investigation was what students said about the mental processes they engaged in while reviewing. Nearly all students reported, without prompting, that during reviewing they mentally 'compared' the peers' works against the work they had individually produced beforehand (or more accurately, a mental representation of that work) and that they transferred ideas generated through this comparative process to inform their own work. Specifically, students reported seeing things in the peers' works – different approaches to the task, alternative arguments, perspectives or solution strategies, or errors or gaps – that led them to construct ideas about how they might improve their own work, ideas which they did use to improve their work even before they had received feedback from peers. In effect, these students were alluding to what in this article I am calling generative or inner feedback, as it is the output of an inner evaluative and comparative process (as is all feedback).

The following is a comment from a student in the Nicol et al (2014) study;

I think when you are reviewing...[the work of peers]...it's more a self-learning process, you're teaching yourself; well, I can see somebody's done that and that's a strength, and I should maybe try and incorporate that somehow into my work. Whereas getting...[teacher]... feedback you're kind of getting told what to do; you're getting told this is the way you should be doing it, and this is the right way to do it. You're not really thinking for yourself.... I think...[reviewing]... would help you not need so much of teacher feedback, if there was more of this. Whereas, I think if you're not being able to do...[reviewing]... then you will always be needing more...[teacher feedback]...

This finding - that reviewing activates processes of reflection and inner feedback generation - is very robust. I have replicated this with students across a range of disciplines (accountancy and finance, engineering and education) and with groups of students in a single 1-1.5 hour workshop. In these workshops, students first write a short argument on a relevant topic and then review those written by same-level students in earlier workshops. Importantly, the students do not receive any feedback. In this scenario, when you ask students what they learned from this experience, they always talk about how they compared their own argument with those they reviewed and about how this led them to think of ways of improving their own work.

Requirements for inner feedback to activate learning

From my research into peer reviewing, a number of requirements emerge as necessary for the activation of productive inner feedback. The first requirement is that all students must produce work in the same topic domain before engaging in reviewing. This is necessary so that each student has a range of similar works to compare their own work with and against which to generate inner feedback. From this perspective, reviewing the works of a peer is quite different from reviewing an

academic article. Secondly, a deep level of cognitive engagement is required to activate the inner comparative processes required for productive inner feedback. Useful inner feedback does not occur when students merely read the work of peers (Cho and MacArthur, 2011). In effect, reviewing is productive because it calls on students to make evaluative judgements, to engage in problem detection and in problem solving activities. Thirdly, writing out feedback explanations for peers helps promote inner feedback generation as, in order to write a feedback response, students must revisit their own understanding of the topic domain (which takes them back to what they wrote beforehand), rehearse that understanding and construct new understandings. Fourthly, and this is implied by some of the above, inner feedback generation is not very effective if students are merely asked to evaluate and comment on their own work, without any external input. There is a great deal of research showing that students have difficulties in self-assessing their own work (Brown et al, 2015). In peer review it is the sequence of producing external then internal feedback that enables students to see their work in new ways and, in turn, to generate new feedback about it.

Benefits of inner feedback generation

There are many reasons for engaging higher education students in the activity of reviewing the work of their peers. First, the practice of reviewing develops in students important evaluative, critical thinking and problem-solving skills (Cho and MacArthur, 2011; Cho and Cho, 2011; Nicol, 2014). Students also learn how to formulate constructive feedback advice for others about their work. These evaluation and feedback-skills are important in all professional and employment contexts, yet surprisingly they are not usually taught at University where the predominant practice is that students are subject to teachers' evaluations and feedback.

A second reason for reviewing is that it puts feedback processes back into the hands of the student. It is an empowering process. It is the student herself who identifies the improvements required in a completed work, not the teacher or a peer.

As the student is constructing external feedback for others, she is creating inner feedback meanings for herself. Moreover, many students claim that because reviewing puts them in control of feedback processes, it reduces their need for teacher feedback (see quote from student above).

Another characteristic of reviewing is that the feedback students generate for themselves usually goes beyond what a teacher would normally provide, especially if students review a number of peer works of different quality. This is exemplified in the following quote, where the student is responding to the question ‘what do you think is better for learning, giving or receiving feedback?’

For me it would probably be to give feedback because I think seeing what other people have done is more helpful than getting other people's comments on what you have already done. By looking at other people's work you can see for yourself what you have forgotten or not even thought about. When people give feedback on yours they generally just talk about what is there. They don't say, well I did this on mine and you could put that in yours.'
[Nicol et al, 2014]

This response highlights a common limitation of teacher feedback, namely, that it is invariably framed only with reference to what the student has produced. The teacher comments on ‘what is there’ not ‘what might be there’. Even if the teacher were motivated to provide alternative perspectives, it would be difficult to sustain such an approach in courses with large student numbers. Yet, being able to judge work from many different perspectives is an ability that experts possess and that warrants deliberate development through the curriculum. Reviewing not only opens up this possibility but it also positions the student as the agent for it.

A further feature of reviewing that is quite unusual but powerful is the way students engage with criteria. During reviewing, students both create criteria and apply criteria. They create criteria when they compare the peers’ works with their own and ‘notice’ differences. On the other hand, they apply teacher-provided criteria when they frame their written feedback response. Elsewhere, I have argued that

the simultaneous operation of these two processes (i.e. creation and application of criteria) builds students' own internal repertoire of criteria and, in turn, their own internal concept of quality. (see Nicol, 2014 for an elaboration of this point).

Future Research

The research on reviewing shows that students can generate productive inner feedback on their own academic work even without any external feedback input from a teacher or peers. This finding opens up many possibilities for the enhancement of student learning and for the development of self-regulation. It also suggests new directions for future research. For example, instead of investigating 'how to improve students' use of external feedback?' the focus for this research would be on 'how to improve the power and quality of learner-generated feedback?' One avenue for this research involves investigating how the 'transfer process', from external reviewing to internal feedback generation, can be strengthened. A productive approach here is to make inner feedback construction more explicit by, for example, having students self-review their own work and write out their own self-feedback advice immediately after reviewing the work of peers. I am currently piloting variations of this approach with colleagues teaching a third-year psychology and a first-year accountancy course.

Another avenue of research involves controlling more carefully the quality of the peer works that students review, in order to maximise the likelihood that the reviewing process will help them develop their understanding of what good work comprises (and hence develop a valid internal concept of standards). Prior research suggests that this requires that students confront a range of works of different quality, including some of a very high quality. The latter can be a problem, however, in many peer review designs, especially with large number of students, as software usually randomly allocates the works for review. This arrangement limits control over the quality dimension. Nonetheless, there are ways of overcoming this obstacle, such as inserting some high-quality works that all students

must review into the randomised set (e.g. written by the teacher or selected from those of a previous student cohort).

A third area in need of research is how to assure students, even those who claim that reviewing is empowering and who show significant learning gains from participation, that they can rely on their own performance judgements, and that there is not one correct answer, as far as complex and open-ended assignments are concerned. This issue seems to be more problematic in the early undergraduate years, which suggests that strategies are required to build up students' confidence during those years.

Conclusion

It is not the intention in this article, to suggest that students produce all feedback on their own without any teacher input. Rather, the argument is that while teacher feedback is important, in many circumstances, its provision would be best after students have produced as much feedback as they can by themselves. This would not only keep the focus on developing students' own self-regulatory abilities but in all likelihood it would also lead to an increase in students' receptivity and utilisation of teacher feedback, enabling it to be more easily turned into inner feedback.

In conclusion, it is worth noting that in my recent studies students have responded very positively about their experiences of reviewing. It appears that if the rationale for reviewing is clearly explained at the outset (I often also discuss the published research) that students not only become receptive but even enthusiastic to participate, and that participation brings with it further commitment, as the following quote from a student in a recent study illustrates:

... Reviewing required that I evaluate and understand the strengths and weaknesses of the work done by my peers. By doing this, I realized I was involved in a self-learning process: stimulating reflection on my peer's work also encouraged me to reflect on my own, on what I had accomplished. It was also very useful to evaluate a

task that I also had to do, because through the comparison new reflections emerged that helped to improve my work. [...] As for receiving feedback, in my experience I have always learned something, but maybe this never caused me to reflect back deeply on what I had done. I think it's really important to be involved in the learning process, it's necessary to take an active and not just a passive role. By evaluating a peer's work, you are encouraged to reflect and consequently self-assess your own work. Receiving only feedback alone can prevent awareness and reflection on what has been done, and above all, it encourages less self-evaluation.

(from, Nicol, Serbati, Grion and Tracchi, in preparation)

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