

Reconceptualising feedback as an internal not an external process

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Riconcettualizzare il feedback come processo interno e non esterno

Students are producing internal feedback all the time as they monitor, evaluate and regulate their own learning. When they receive external feedback information from a teacher it has to be turned into internal feedback if it is to have any impact on learning. Recent research on peer review shows that students can generate productive internal feedback by themselves without any teacher input. Specifically, as they produce written feedback on the work of peers, they simultaneously reflect on and generate internal feedback on their own work. Strengthening internal feedback develops the students' capacity to think for themselves and to become independent self-regulating learners. This article therefore makes the case for internal feedback, illustrates its operation in peer review and points to its promise as a guiding concept for future research and for improvements in practice.

Keywords: Internal feedback, peer review, self-regulation, learning, compare, self-review

Gli studenti producono continuamente feedback interni mentre monitorano, valutano e regolano il proprio apprendimento. Anche quando ricevono feedback esterno da un docente, esso deve essere trasformato in feedback interno se si vuole che abbia un impatto sull'apprendimento. La recente ricerca sulla peer review dimostra che gli studenti sono in grado di generare autonomamente un feedback interno produttivo senza alcun contributo da parte dell'insegnante. Nello specifico, producendo feedback scritto sui compiti prodotti dai propri pari, essi simultaneamente rifletttono e generano un feedback interno sul proprio lavoro. Il rafforzamento del feedback interno sviluppa la capacità degli studenti di pensare in modo autonomo e di autoregolare il proprio apprendimento. Questo articolo, analizza il feedback interno, ne illustra il funzionamento nella peer review e indica la sua dimensione innovativa come concetto guida per la ricerca futura e per i miglioramenti nella pratica.

Parole chiave: Feedback interno, revisione tra pari, autoregolazione, apprendimento, confrontare, auto-valutazione

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Introduction



By far the most common way of thinking about feedback in higher education is as a transmission process in which teachers, who are experts in the discipline, provide feedback advice to students on their completed academic work in the form of written comments (e.g. about strengths, weaknesses and how to improve that work). Surprisingly, considering the widespread, but usually tacit, acceptance of this idea there is little published evidence that students do learn from the mere act of receiving feedback comments from teachers. Over the last 10-20 years, in reaction to research showing that “feedback as telling” is not very effective, and as a result of some theoretical articles arguing that transmission is too simplistic a conception of feedback (e.g. Sadler, 2010; Boud & Molloy, 2013; Nicol & MacFarlane-Dick, 2006), there has been a move away from this conception. Researchers are now in agreement that to learn from feedback students must, at the very least, have opportunities to construct their own meaning from the transmitted information, they must do something with it, analyse it, discuss it with others and connect it with prior knowledge. This idea that feedback is an “interactive” process, that requires action by the student as well as by the teacher is represented in the research literature through the prevalence of expressions such as “feedback is a dialogue”, “feedback is a cycle”, “feedback is a two-way communication process” and by calls for students to develop “feedback literacy” (Nicol, 2010; Hounsell, D., McCune, Hounsell, J., & Litjens, 2008; Winstone, Nash, Parker, & Rowntree, 2017; Carless & Boud, 2018).

While this two-way “interactive” perspective on feedback is an advance over the transmission view, it is not without its own problems. One issue is that it still, at least in part, pivots on transmission thinking, only now the focus is on how students respond to the transmission rather than to the quality of the transmission itself. Boud and Molloy (2013, p. 703) capture the essence of this problem with their claim that even though students are now seen as active rather than passive «others are...[still]...required to identify and provide the information students need to learn, and that learning is driven by how others go about this». Orsmond and Merry’s (2011) research highlights another

issue, namely, that for weaker students the more they are “expected to respond” to the feedback they receive from teachers the more dependent they become on their teachers, and the more likely they are, slavishly, to produce these “expected” responses rather than to think for themselves. So how might we more usefully conceptualise feedback in relation to learning?

1. The case for internal feedback

In addressing this question over a number of years I have been arguing that we should re-focus the way we think about feedback, away from its *external* provision (from teachers and others), and away even from students’ reactions to or use of external feedback, and instead concentrate more on *inner feedback* – the *feedback that students generate themselves* and that enables them to self-regulate their learning (Nicol & Macfarlane-Dick, 2006; Nicol, 2013).

The starting point in considering feedback is to recognize that students are always producing it internally, whether they are consciously aware of it or not. It occurs during all activities and hence also whenever they engage in learning activities or produce any academic work – it does not depend on teachers. Without inner feedback the behaviour of students would be random and unpredictable. For example, when engaged in a learning task, this feedback derives from students’ inner monitoring and evaluation of discrepancies between current and intended performance, the latter determined by some mix of students’ own goals and the information about task requirements communicated by the teacher. In fact, students go through cycles of internal feedback generation, it is a recursive process that unfolds as the work is being produced. As Butler and Winne (1995, p. 246) state «[internal]...feedback is the inherent catalyst for all self-regulated activities». It is the raw material that learners use to regulate learning – it informs and shapes engagement and learning progress.

In this conception, the relation between external and internal feedback is complex. It is not that these are simply two different feedback “sources” with external feedback referring to information provided by an external agent (e.g. teacher or peer) and internal feedback referring to information generated by the learner herself. Rather, the critical point is that inner feedback is inherent in any use of external feedback. Whenever external information or advice is provided by teachers, this has to be turned into inner feedback if it is to influence subsequent learning and performance. Indeed, if students do not understand the





teacher's comments, are not able to evaluate their worth or to compare their meaning against the work they have produced, and hence do not generate inner feedback from these evaluative processes, such "external" information cannot really be called "feedback" (Nicol, 2014). In fact, the provision of information by the teacher only initiates feedback processes in the student's mind - it is not feedback in and of itself. 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.

Although this idea of internal feedback is not new and has been proposed before (Butler & Winne, 1995; Nicol & MacFarlane-Dick, 2006; Andrade, 2010), it has not to date occupied a central position in research or practice. One reason for this is, that being an internal and tacit process, it has been difficult to see it and hence to plan for it. However, recent research on peer review is beginning to address this issue.

2. Peer Review

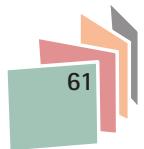
Peer review, as discussed in this article, refers to scenarios where students evaluate and make judgements about the work of their peers and construct a written feedback commentary (e.g. about the quality, value or success of that work). It does not refer to scenarios where students mark or grade students' works. This is normally referred to as peer assessment and it is fraught with difficulties (Kaufman & Schunn, 2011).

In peer review, students first produce some written work individually. In this article I assume that this is a complex work such as an essay, a report, a design plan and so on. Following this, students are randomly assigned a number of works written by peers to evaluate. By evaluate, I mean comment on these works in writing in relation to some criteria, usually provided in advance by the teacher, although students might have some role in their construction. After the reviews are completed, students receive the feedback comments written by peers. If there is time students will have an opportunity to update their work after reviewing and/or after receipt. Around this core sequence (produce work, review works, receive reviews) there are many possible variations in how peer review is implemented. Where student numbers are large software is usually used to manage the distribution of works for review and, if required, to render those works anonymous to reviewers.

2.1 Learning through reviewing

In the past, research on peer review primarily focused on the benefits that students gain from receiving extra feedback from peers, over and above what they might receive from their teacher (Topping, 1998; Falchikov, 2005). However, recent research has focused instead on what students learn from the “reviewing” component of peer review. This research shows that not only does reviewing on its own (i.e. without receiving peer feedback) lead to learning gains (e.g. as shown by students’ subsequent work on the same topic) but also that the gains from reviewing are usually greater than those from receiving feedback reviews (e.g. Cho, K. & MacAurthur, 2011; Cho, Y. H. & Cho, K., 2011). A key interest in this research is in what causes these learning improvements. The answer is not as straightforward as it seems at first.

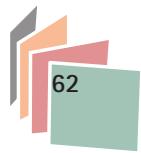
While reviewing involves students in producing external written feedback for their peers, the learning that results is actually due to the inner feedback that students generate on their own work during re-reviewing (Nicol, Thomson, & Breslin, 2014; Nicol, 2014; McConlogue, 2014). What makes peer review unique is that before reviewing the work of peers, students will have invested considerable time and effort in producing work themselves in the same topic domain as their peers. Hence, reviewing activates an “unavoidable” reflective process whereby students compare their own work (or a mental representation of that work) with the work they are reviewing and transfer ideas generated from that comparison process (e.g. about content, approach, about weaknesses and strengths) to inform and improve their understanding of their own work. This is different from other academic situations where students evaluate a research paper or a disciplinary text, as they would not have produced a similar text themselves beforehand and hence this would not activate the same comparative and inner feedback generation processes. Notably, this “refection” in reviewing is not just about “deeper thinking”, the commonplace meaning of that overused term. Rather, reviewing in peer review triggers real “reflection” in that the peer’s work acts as a mirror or lens against which students compare, re-envise and re-evaluate their own work. Also, their own work simultaneously acts as a mirror on the works they are reviewing. The complexity and implications for learning of this two-way mirroring have not so far been unpacked in the feedback research.



3. Researching inner feedback generation

In my initial investigations of peer review in engineering, I discovered that inner feedback generation is a spontaneous and invariable process, as long as students have invested effort in producing similar work as their peers beforehand (e.g. Nicol et al., 2014). Later, I found that it was possible to give students a convincing experience of this reflective comparative process (and hence of inner feedback in operation) in a single workshop by having them produce a short text on a topic and then evaluate some similar texts, normally selected from those produced by students in an earlier workshop. In such workshops, and in my early studies of peer review, the research evidence of inner feedback generation was derived from students' self-reports and from the improvements they made to their work after reviewing, but before receiving feedback from peers, which were considerable. However, once proof of concept of inner feedback generation had been established, my subsequent studies have involved deliberately enhancing inner feedback by making it explicit by having students write out an account of what they are thinking immediately after reviewing a peer's work. While students may not be completely able to express all aspects of inner feedback, and externalising it in writing may alter its nature to some extent, I reasoned that making it explicit and conscious to the students would nonetheless strengthen its impact. It would also allow me to research internal feedback. An example will clarify.

In a study with 150 first year Accounting and Finance students at the University of Glasgow, the task was to write an essay and then to review three peer essays (Nicol & McCallum, 2019). Two of the three essays were randomly drawn from the class cohort and the third was of a very high standard written by a student who took that course the year before. Immediately after reviewing each peer essay against the criteria (which these students helped to construct), the students were asked to provide written answers to three questions intended to externalise self-generated feedback. The first question asked students to compare their own essay with the peer's essay and to identify the most important differences between them. The intention here was to strengthen the spontaneous comparative process that is known to occur during reviewing. The second question asked them to say what they learned from these differences - the students were advised beforehand that you learn from weaker as well as stronger essays. The intention here was to strengthen self-reflection and inner feedback generation by having students make explicit and amplify what they were learning. Also, this was intended to build students' awareness of themselves as



learners and feedback as a self-regulatory process. The third question asked student to make an overall judgement about which essay was better and to explain why. The intention here was to develop the students' capacity to recognise and judge what constitutes quality and standards in this domain of essay writing. The inclusion of the high-standard essay was important here as this ensured that all students had a concrete reference work against which to calibrate their judgements of quality. Many other related research studies investigating different variations of this self-review approach are now in progress, both in the UK and Italy, with students from different disciplines (e.g. Economics, Education, Psychology, Mathematics).

3.1 *The findings so far*

Although the data from these new studies where inner feedback has been deliberately strengthened and made explicit has not yet been fully analyzed, emerging results do confirm and reinforce earlier findings regarding the power of inner feedback (Nicol et al., 2014). Across all these new studies, students have been very positive. This is evidenced by the fact that they write copious amounts of self-feedback, well beyond what I would have expected. Moreover, this self-feedback looks remarkably similar to what a teacher might provide. For example, in the Finance and Accountancy implementation students not only provided feedback comments on the disciplinary content of their own essay but also on the writing process, for example on the essay structure, flow, argument, grammar, referencing, introduction and conclusion. Here is a typical account from one student of what he/she learned from reviewing (i.e. from the differences between his/her essay and the one under review):

From this essay I learned that I should go into more detail about relevant items relating to the question instead of using the majority of my word count on useless information. I also learned that adding more statistics would help to make my arguments stronger and hence lead to an all round better essay.

And here a few short quotes from student about what they would improve based on reviewing:

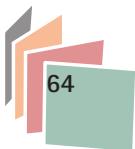
I would make my conclusion stronger because I feel that a weak conclusion leaves the reader with a weak impression of your essay (student 15)



Changes I would make...would be more analysis of points so that it is clear that I have understood the topic (student 75)

I would add more examples and quotes to support my arguments and also review my introduction and conclusion to not include first person and summarise my main points in my conclusion (student 37)

Further analysis of the data from this study is required to determine how valid this feedback is, how it compares with what a teacher would provide, and whether all students, and particularly weaker students, benefit from this process. However, one only need glance at what students generate to appreciate that they are seriously evaluating what they have produced, what they are learning and how their work could be improved, without any direct external feedback input from a teacher.



4. Requirements for the activation of productive inner feedback

From my research investigations, a number of requirements emerge as necessary for the activation of productive inner feedback during peer review (Nicol, 2014). The first requirement has already been stated, which is that all students must first produce work in the same or in a similar topic domain before reviewing. This is necessary to activate the reflective comparisons necessary for inner feedback generation. Secondly, the generation of inner feedback does not occur when students merely read the work of peers (Cho & MacArthur, 2011). A deeper level of cognitive engagement is required. During reviewing it is the requirements to comment on the work of peers that creates that deeper engagement. In my recent studies, my tactic has been to intensify that engagement further and redirect it on to the students' own work, by specifically asking them to make comparisons with their own work. Presumably future investigations will reveal other ways of achieving this. Thirdly, students need to review a range of works of different quality, as it is differences from their own works that trigger the rich inner dialectic required to generate new ideas that promote learning. Unfortunately, in many peer review studies students only review a single peer work.

Fourth, writing out feedback explanations for peers most likely reinforces 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 (Roscoe

& Chi, 2008). Lastly, 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. There is a great deal of research on the difficulty students have in self-assessing their own work (Brown, Andrade, & Chen, 2015). In peer review, it is the sequence of producing external then internal feedback that enables students to see their work from many different perspectives and hence to generate new insights about it.

5. Learning through received feedback

This article has made the case that as far as learning is concerned, at core, feedback is an internal meaning making process largely under the control of students and not an external process, even though external information is required to fuel internal feedback. Consistent with this argument, I have presented peer “reviewing” as a method that can be used both to enhance and externalise students’ generation of inner feedback. However, little has been said up to this point about feedback receipt. As noted earlier, however, external received feedback information must also be turned into internal feedback if it is to have an effect on learning. Taking this perspective, it is also possible to design interventions to enhance the inner feedback resulting from external feedback. One way to do this is to use the self-review approach alluded to earlier. In the Accountancy and Finance course, for example, after students had read all the feedback comments they received from peers they were required to carry out another written self-review of their own work. They were asked (i) what they learned from the feedback they received? and (ii) what additional changes they would make to their work based on received feedback? (i.e. over and above those made after reviewing). Similar processes could be implemented to strengthen the inner feedback that students generate from received teacher feedback.

However, it should be noted that the inner feedback that occurs after reviewing is different in many respects from that generated after the receipt of feedback. The internal feedback derived from reviewing is self-generated (without any prior external feedback input) through scrutinising concrete examples of practice whereas the internal feedback derived from received feedback is generated through reading textual information (i.e. comments) which students must decode and interpret, something they often have difficulty with (and which in reality can never convey what constitutes quality). On the other hand, the internal feedback generated from teacher feedback (as opposed to re-





ceived peer feedback) might be more valid than feedback that is self-generated from evaluating examples of work, even if that work is of a high-quality. Hence, more research is required to ascertain how to balance the best of all these possibilities in practice.

6. Redefining the teacher role

Although students are generating internal feedback all the time, this does not mean that what they generate will necessarily be of a high quality, or that appropriate opportunities will be available for suitable feedback generation, or even, if opportunities are available, that students will be able to make productive use of them. From this perspective, the teacher still plays a central role in the provision of feedback opportunities. One important task is to design scenarios that lead to the productive activation of internal feedback and another is to help students develop their ability to calibrate their own feedback judgements.

To design for internal feedback, the first step is to identify suitable reference information against which students can compare their work. While this article has discussed peer works and peer comments as possible comparators, comparisons could be made against other reference information such as a rubric, assessment criteria, learning outcomes, or against suitable disciplinary examples or texts, or against question prompts or scripts (i.e. cues devised by teachers to support students in generating internal feedback). I am currently investigating the effects of these different comparators on students' feedback generation. Instructing students to make comparisons is also critical, as this will maximise engagement and learning. Also, having students write out or discuss in class their learning from such comparisons is highly recommended. First, this benefits students as it raises their awareness of their own ability to generate feedback and because (as noted earlier) producing self-explanations is itself a knowledge-building process (Roscoe & Chi, 2008). Second, externalising comparisons in this way provides information to the teacher about what internal feedback students are producing, so they can adjust their teaching accordingly.

From an internal feedback perspective, it is better if received feedback from teachers follows rather than precedes other methods of activating self-generated feedback. In other words, teacher feedback should come after students have generated as much feedback as they can by themselves through other comparisons. This keeps the teacher's focus on developing the students' own independence and responsibility

for learning, and it would very likely increase the students' own receptivity and utilisation of teacher feedback (when it is received), enabling it to be more effectively turned into internal feedback. And if teacher feedback follows rather than precedes other modes of internal feedback it would also take on a different role. It would not just be about commenting on the students' work itself but on the students' ability to generate valid feedback about that work, which would, in turn help students learn how to calibrate their judgements about their work.

7. Conclusion

The main intention of this article is to promote a new way of thinking about feedback, a new "mindset" rather than to promote a specific method of feedback practice. What method is used and how it is used depends on mindset. With an internal feedback mindset, new practices will emerge and established practices will be adapted and re-aligned. Importantly, reframing feedback as an internal self-regulatory process will lead to quite different questions about practice than those raised when feedback is viewed as an external process. Instead of asking "how we might enhance student engagement with others' feedback?", researchers and practitioners will ask questions such as (i) what learning environments are most likely to enhance the quality of inner feedback? (ii) what kinds of inner feedback are most conducive to the development of learner judgement? (iii) how can students' awareness of inner feedback processes be raised? and (iv) how can inner feedback be instantiated in ways that best help students develop their understanding of what constitutes quality work? Hopefully some readers will wish to investigate such questions in their own research and practice.



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