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Replacing the feedback loop: Teaching learners to notice

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Abstract *Teachers in higher education often feel frustrated by the modest impact the feedback they provide on student works seems to have in improving student learning. In this presentation, the dependence on feedback is challenged primarily on the grounds that it involves 'telling'. For students to become self-sustaining producers of high quality intellectual and professional 'goods', they must be progressively equipped to take control of their own learning and performance. The alternative way forward begins with a close examination of what proficient the conditions under which students can become better at monitoring the emerging quality of their work during the production process. This requires a reworking of teacher-learner interactions, which not only challenges the dominant feedback-based paradigm, but also has better prospects of developing independence in learning.*

The context

- Assessment is intended to be not only a means of certifying the level of achievement a student reaches but also a site which provides opportunity for student learning.
- These two functions are often referred to respectively as *summative* and *formative* assessment, or '*assessment of learning'* and '*assessment for learning'*, the emphasis being on the prepositions in the middle.
- Potentially all student responses to assessment tasks provide primary evidence about learning or achievement. The context for this presentation is that of assessment tasks that require students to produce 'complex works'.
- For the purposes of this presentation, a complex work is something which a student produces as an extended response to a divergent assessment task and which requires qualitative judgment for its appraisal. Examples are term papers; essays; written assignments; field and project reports; seminar presentations; studio and design productions; specialised artefacts; solutions to technological problems; professional procedures; clinical consultations; musical, dramatic and other creative works; client interviews and so on.
- I am not talking about multiple choice or other objective tests, or simple recall items that can be scored correct or incorrect. They raise special problems of their own and need separate consideration.
- Terminology: I do not draw a sharp line between these terms: achievement, attainment, performance, accomplishment, capability, proficiency and competence. Some of these fit some contexts between than others.

Learning for complex outcomes

- The three basic requirements for a learner to become proficient in some domain (in an intelligent rather than random way) are that the learner:
    - Comes to possess a concept of high quality – as a goal, or reference level, to be aimed for;
    - Is able to compare the actual (or current) quality of (their own) performance with the reference level (appraisal, judgment) – unaided; and
    - Can engage – also unaided – in appropriate action which leads to some closure of the gap between their actual level at any time and the goal level.
- This commonly requires (a) practice; and (b) some iteration during the process of producing a complex work. In life outside the higher education institution, the complex work is usually intended to serve some purpose or achieve some end. Within the education institution, it provides concrete primary evidence of the level of the learner's achievement status.
- To produce a high quality work, students need to monitor the emerging quality of their productions – and make adjustments as necessary – in real time while the work is still under construction. Control during production, which is the site where students operate most intensively, involves all three conditions (goal knowledge, monitoring, and gap closing). Students must attend:
    - To the ***large scale*** (how the work is coming together as a whole); and
    - To the ***small scale*** (point by point tactical decisions).
- For both of these, learners need to have acquired the relevant skills, know-how, and knowledge.
- Focus now on what accomplished producers typically do during the construction process.
- In particular, explore what they actually do in constructing complex responses to divergent assessment tasks in teaching-learning settings. How does the accomplished producer engage, cognitively and procedurally, in creating a complex work of high quality? What knowledge and skills are required? How are these applied in practice?
- If we can answer these questions satisfactorily, it should become more evident how we should design learning environments in order to increase the likelihood that students will eventually master what is required – and then carry that capability forward to new situations.
- Without those answers, the proper role of feedback cannot be determined.

The title of this article…

- … is: Replacing the feedback loop: Teaching learners to notice
- I now focus on

- the nature of feedback;
- its status in our approaches to facilitating student learning; and
- why we as educators should take steps to replace it with a more productive approach.

- By 'feedback' I mean:

  Any comment ♦ in any medium ♦ composed by the teacher/tutor/marker/graduate assistant ♦ for the student ♦ about one of their works ♦ but not including the mark or grade**.**
- Feedback is often taken as a (or possibly ***the***) critical element in helping students learn from an assessment event.
- Feedback is ***intended*** to make a difference. It ***should*** lead to improvement. But in practice, feedback *often has* ***no effect whatever***.
- Creating good feedback is resource intensive, but also largely ineffective. This is the perfect recipe for a ***low return on investment***.
- What can be done? Option 1: Improve the quality of the feedback and how it is offered. There are enough people working diligently on that front for me to be confident that if ways can be found to make feedback more effective, it will be found.
- Option 2: find an alternative. This presentation is about Option 2.
- My view is based on the following PREMISE – which happens to be negatively worded:
  - The major problem with elevating feedback to the prominence it currently enjoys is precisely and fundamentally because feedback has been ***largely about telling*****.**
- Research into human learning informs us that there is only so much a person can learn ***purely from being told***. (Most parents know that already.) Put bluntly, too much contemporary assessment practice is focused on communicating better with students.
- 'Teaching by telling' is the familiar ***transmission model of teaching***, widely regarded as unsatisfactory for complex learning. Yet the form and context in which feedback is constructed and delivered too often follows that model. Recent work on dialogic feedback is an improvement on that, but does not go far enough.
- MY POSITION: Fundamentally, I am ***less interested*** in resetting the parameters of teacher-produced ***feedback*** than I am in the more basic issue of using assessment as a way of ***enhancing student learning***. That allows the issue to be ***framed differently***.
- Now let's think about what producers of complex works typically do during the process of production.

Competent producers of complex works

- For many complex works, the precise nature of the end product is not known beforehand. However, during productive activity or the process of solution, its nature can develop or be clarified as it emerges.

- There are no precise blueprints, algorithms or production formulas for getting to the end point, and there is no optimal path to it.
- Often, producers start with what they understand to be a more or less clear idea of the problem but initially only tentative ideas of possible solutions and solution strategies. Their works take progressively more concrete form as they make trial moves, assess the effects of these, make amendments, and at various points modify the overall design. This is all directed towards creating works (or solutions) of high quality.
- Producers of consistently high quality works:
    - Know ***when and how to adjust*** provisional plans, and to substitute alternative moves when some attempted moves do not work out;
    - ***Notice things that matter*** and must be attended to, but pay relatively little attention to minor aspects;
    - ***Recognise why*** and how the organisation of each ***work may need to be revised*** as it starts to take shape; and
    - Do not necessarily ***verbalise all*** that they do as they do it, but ***may reason out parts*** of it.
- Competent producers or practitioners (say, of a complex written work) can detect anomalies, inconsistencies, continuity lapses, potential ethical dilemmas, lack of precision in wording, infelicities in style, and issues left hanging and unattended to. They can identify special points of insight or strength. They can protect, elaborate or relocate them as development progresses. If the work is a complex procedure or performance, their knowledge and thinking grows, and they engage in sophisticated contingency management. They identify their own mistakes, 'sense' weakness or incompleteness, and make appropriate changes – for reasons they would find difficult to explain to themselves or to others. They can project themselves into the perspective (or position?) of the subjects of their attention (in certain human service fields and professions); or into the role of audience, consumer or observer (if they produce live or artefactual works).
- In short, they
    - possess a refined sensitivity to contextual cues, on the run and including those of their own creation; and
    - know what to access and draw from their personal repertoires of potential moves in order to monitor improve their work or performance.

A practical way forward

- To the extent that this is a fair portrayal of what competent producers do, the issue for us as teachers is to figure out how learners can acquire or develop those types of skills.
- Feedback as traditionally conceptualised largely involves the teacher-marker running with the overall production and the detail in it both in mind. The crucial thing is that it ***the marker who does the noticing, the repair thinking, and identification of ways to improve***.

- One of the classic models of a feedback cycle involves the following components: A ***reference level***, a ***sensor*** (which produces a signal that can be interpreted), a ***comparator***, and an ***effector***.
- The ***sensor*** monitors the main (output) parameter of a system and sends that information to a ***comparator***, which compares the incoming data with the fixed level set in advance as the reference level. If the difference exceeds a certain threshold, the comparator sends a message to an ***effector***. This is a part of the system which has power to change some other parts of the system so that overall its condition shifts towards the ideal state, and continues to shift until the signal from the comparator indicates no more change is necessary. Think of an air conditioning or other thermal control system (automatic oven, car cooling system). In many such systems, the sensor, the comparator and the effector are distinct physical devices.
- Feedback as commonly conceptualised in educational systems borrows this model, but it does not achieve what we want, for this crucial reason: the sensor and the comparator functions are largely carried out by the assessor while the effector is the student. ***The problem is the disconnect between the two***.
- The competent producer or practitioner is able to act as all three: sensor, comparator and effector.
- Many of our teaching 'systems' assume that students can become sensors and comparators essentially by being consumers of external information (from the teacher or peers). They cannot. They need to develop awareness and sensitivity so they can detect anomalies or problems ***for themselves***. They need to know when something matters in and of itself, and when exactly the same thing matters in some contexts but not at all in others. This is a significant contextualised figure-ground skill that must be developed.
- The substantial literature on the ***nature of expertise*** and how it is developed is an important resource for our thinking. Ultimately, we hope our students will have been at least launched on a path towards professional expertise by the time they graduate.
- This literature includes some of Wittgenstein's writings (*Philosophical Investigations*), the classic works of Dreyfus & Dreyfus on levels of proficiency from beginner to expert and Benner's work (in nursing). The nature and development of expertise is of enormous interest in the education of medical and health practitioners, airline pilots and many other professionals who are involved in complex decision contexts. The short story is that a great deal of what they require cannot be expressed in words, (and thus 'codified').
- Listen to Wittgenstein: "I contemplate a face, and then suddenly notice its likeness to another. I *see* that it has not changed; and yet I see it differently. I call this experience 'noticing an aspect' ". [XI, p.93]

- Also: Dreyfus & Dreyfus: "…experience-based similarity recognition produces the deep situational understanding of the proficient performer. No new insight is needed to explain the mental processes of the expert. With enough experience with a variety of situations, all seen from the same perspective or with the same goal in mind, but requiring different tactical decisions, the mind of the proficient performer seems gradually to decompose this class of situation into subclasses, each member of which shares not only the same goal or perspective, but also the same decision, action, or tactic. At this point, a situation, when seen as similar to members of this class, is not only thereby understood but simultaneously the associated decision, action or tactic presents itself." [p. 225].
- They argue that experts regularly use their 'intuitive rationality'; sometimes use 'deliberative rationality' when time permits and this provides a way forward; and much less often 'calculative rationality', the kind that is systematised and formularised (as is used with rubrics and criteria-standards matrices).
- This is why I suggest another starting point, the three questions on which we need to base a strategy being:
    - What do experts do?
    - How does their expertise manifest itself?
    - How can we help students towards becoming experts?
- In one sense, we could say that students need to take over the sensor, comparator and effector functions for themselves. Thinking this way runs the risk of containing our conceptualisation of the issue still within the model of a standard feedback cycle. So let us park that model.
- The knowledge and skills students require does not, and cannot, come about by being told about them. How does one explain to another person ***what they should notice*** in a particular context (including those of their own creation) but is not worth noticing in other contexts if the possible occurrence or existence is not known in advance, and there are extremely large numbers of things (features, aspects, characteristics) that are ***potentially*** worth noticing?
- This is ***'know-to' knowledge***; knowing *to* do something, and figuring what to do, or to try. Know-to knowledge must be developed directly by learners if they are eventually to become self-monitoring. The most we can do as teachers is provide the appropriate teaching-learning-assessment environments in which learners can grasp the high-order skills required, without the means becoming unduly labour intensive for the teacher.
- The knowledge and skills students require comes about through ***immersion in a decision space that is similar to that inhabited by the teacher***, through sensing the emerging overall quality of something, detecting weak spots, making and accounting for qualitative judgments, and knowing where, when and how to make changes.
- It involves understanding the macro-level and micro-level determinants of quality and knowing ***how to shape the work as a whole*** through employing small-scale tactics.

- It involves a special type of 'seeing', which can be acquired only by being immersed in contexts where ***configural*** (rather than ***componential***) judgments are demanded. I say 'special type' only because it goes unrecognised in most of the research on assessment for learning, where the focus is on feedback. Special should not be interpreted as esoteric; it is a key part of everyday thinking.
- It comes about as students learn not only the technical side of self-assessment but also how to detach themselves from their own productions, regardless of whether these are completed or still under development. Learners need to be able to make arms-length judgments about the quality of their ***emerging or completed work***, and not consider it an extension of themselves as persons. (That presents a non-trivial affective challenge for many students.)
- Putting this into practice can become a powerful teaching approach, and produce positive reactions from students. It need not be labour intensive; it must not become formularised.
- There is one final question I answer before I finish with a story: Are there no circumstances at all where external feedback can lead to improvement? Answer: Emphatically YES! But only when certain conditions are satisfied.
- The most crucial condition is that the producer already possesses enough explicit knowledge and tacit knowledge to understand the full implications of the feedback. Only then appropriate action can be taken.
- An illustration lies in the reviews of manuscripts for publication; some authors do not know enough about academic writing and publishing for the reviewers' feedback to be understood and utilised, unless as a recipe to be followed blindly. Other authors understand that something they happened not to 'see' for themselves when they produced their work initially has been subsequently 'seen' or 'noticed' by a reviewer, and its significance is grasped immediately.

A story

This is the story of how I have tried to induct my own (undergraduate) students into the idea of making holistic judgments, complete with rationales for those judgments – and to press them to be realistic and honest about those judgments. Many students have said to me that they had not encountered this sort of process before, but it is simply a form of structured peer assessment.

Initially, I required students to create short works, 300 words each. We de-identified them, and then randomized their re-distribution to other students in the group.

My next step was to pose three very simple questions. The first was: "How good is the work you have just received to appraise?" Students' initial concerns were interesting, but followed a consistent pattern. They said, "Well, how would I know?" I said, "Have a good look, and think". "Why aren't you giving us criteria?" (This was because most of the students' earlier peer assessment activities in other courses had employed preset criteria.) My response: "Well, I want to teach you about quality. Be patient, even though at the beginning you might find that the way I do this leaves you feeling insecure. Let's start again: How good it is? Do you respond to anything; do you react to anything? How does the piece of work in front of you come over?"

I would now add a refinement to that. I would require students to physically represent the quality of the piece they were reading so that they make a formal commitment to a decision on quality, not just some nice words. The technique I recommend is to represent that the judgment about quality by the placement of an X on a simple line segment – say, 120 mm long – which does not have scale points of any kind. The only specification is that the 'Low quality' end is on the left, and the High on the right.

Here is my reason for preferring this form of representation. Using standardized symbols (such as marks; letters A+, A, A-, B+ …; or grade division points on a scale) tends to cloud the main issue. The act of (alphanumerically) coding a judgment is loaded towards past marking practices, habits and interpretations. For example, if a mark of 70 has traditionally been the cutoff for a particular purpose (an A, or First Class), the students often switch their minds to the coding problem rather than learning through multiple experiences how to conceptualise 'quality'. The suggested technique provides a more open platform for representation of the level of quality.

The second question was: "Why do you make that appraisal; what are your reasons?" Students were asked to justify their appraisal by writing not more than 70 words.

And the third question was: "What advice would you offer the producer as to how the work could be done better next time?"

Once, to my surprise, a student came up and whispered to me, "You know, this one I'm looking at isn't very good." "Oh? Why isn't it?" "Umm, well the person hasn't actually done what you asked them to do." I thought, "Oh what a surprise! I've never heard that before! Much!"

For the first time ever, they had recognized a problem. How many times had I written, "Question Not Answered" on exam papers since I started teaching in 1965? Thousands of times! I would have worn out many rubber stamps if I'd had the stamps to do it, because it happened so often. Yet somehow the students couldn't make the connection between what I wanted them to do, what they delivered, and the feedback I had previously been so anxious to give them. It just didn't work effectively. So I added a fourth question, to be answered as the first but after only after some experience with the original three questions. It is important for students to discover for themselves, if possible, that other students did not necessarily address the issue posed. The new first question was: "How well does the response address the issue stated?"

The four questions had the effect of requiring students to attend closely to the characteristics of the work, to look – ***and notice***. The process encouraged students to focus intensely on the actual works and their properties, without the strictures of any standardized appraisal template. The hope was that students would develop experientially the ability to make both macro and micro appraisals, initially of works other than their own. This would better set them up for later transfer and application of that knowledge to self-monitoring the quality of their own work during its production. The main intended benefit was for students as budding assessors, not as consumers of the feedback from peers.

- Much more than we give them credit for, students can recognize, or learn to recognize, both big-picture quality and individual features that matter. They can decompose judgments and provide (generally) sound reasons for them.

- That's the platform we should start from, not from the assumption that students can learn from being told. They need to learn to ***discover what quality looks and feels like***. They need to need to understand what constitutes quality – generally, and specifically for particular works. Equally, they need to be able to detect and understand aspects – whether large or small – that detract from it. They need to develop a vocabulary for expressing and communicating what they find, at the least that part of their evaluative knowledge that can be expressed in words. Furthermore, they need to gradually attune their growing realizations and discourse to the norms of the discipline, field or profession.
- You can now see, I hope, how a fixation on the importance of feedback can short-change the students. Only after students have acquired a sufficient base of appropriate tacit knowledge can they can understand the content and implications of marker-initiated feedback. At that point, feedback can be effective as learners become more discerning, sometimes more intuitive, sometimes more analytical, and but generally more able to create high quality productions on demand, outside the context of particular others.

Two final questions

I expect there are many questions in your mind that you would like to ask me. I will raise two myself, and provide responses.

QUESTION 1: Is not what is being proposed just a variation on peer and self assessment?

ANSWER: Basically, it is. But it is to be carried out with a special agenda. We need to create mutual assessment environments with two key features. (a) Students need to appraise multiple works that all responses, including the appraiser's, are to the same assessment task. As I explain in *Beyond Feedback*, students need to see as extensive a range of quality as possible, and students need to see and appreciate how quite different works can be legitimately judged to be of about the same quality. (b) Many peer assessment protocols employ several fixed parameters, such as all appraisers must work to the same criteria. The approach needed must be as open as possible, with no set criteria. The criteria are deliberately not specified in advance but have to emerge through the explanation of an appraisal, because only those that are relevant to the appraisal need to be identified. This means that somewhat different criteria sets may be invoked for different works (even those of the same quality). This is not an aberration; it is precisely the point.

QUESTION 2: Are not students still dependent on feedback? The fact that it now comes from other students rather than the teacher/tutor/marker does not change anything, except to provide possibly inferior feedback!

ANSWER: The main value for the students is in developing their answers to the fur questions above, not in being consumers of other people's feedback. The aim is to provide real appraisal contexts in which students gain experience in multiple judgments. Requiring them to commit themselves to a representation of the level of quality (by the X on the line segment), to explain the judgment, and to make suggestions to the original producers is not a waste of time. We all face times when we think we thoroughly know something, but when we come to commit it to paper or speech, we discover out knowledge was not as tidy as we may have thought. Externalising it makes a difference to the structure of the knowledge we hold. A certain seriousness of purpose enters into the exercise from knowing that an appraisal, its justification and suggestions for improvement will be later accessed by the producers of the work, and in all probability discussed and debated (Abercrombie, 1960).

Conclusion

- Let me conclude by quoting a few sentences from the abstract of my 1989 article:

  "A key premise is that for students to be able to improve, they must develop the capacity to monitor the quality of their own work during actual production. This in turn requires that students possess an appreciation of what high quality work is, that they have the evaluative skill necessary for them to compare with some objectivity the quality of what they are producing in relation to the higher standard, and that they develop a store of tactics or moves which can be drawn upon to modify their own work. It is argued that these skills can be developed by providing direct authentic evaluative experience for students. Instructional systems which do not make explicit provision for the acquisition of evaluative expertise are deficient, because they set up artificial but potentially removable performance ceilings for students."

Further reading

Abercrombie, M. L. (1960). *The anatomy of judgement: An investigation into the processes of perception and reasoning*. London: Hutchinson.

Benner, P. (1984). *From novice to expert: excellence and power in clinical nursing practice*. Menlo Park, CA: Addison-Wesley.

Dreyfus, H. L. & Dreyfus, S. E. (1984). From Socrates to expert systems: The limits of calculative rationality. *Technology in Society*, **6**, 217-233.

Nicol, D. (2010). From monologue to dialogue: Improving written feedback processes in mass higher education. *Assessment and Evaluation in Higher Education*, **35**, 501–517.

Polanyi, M. (1962). *Personal knowledge*. London: Routledge & Kegan Paul.

Sadler, D. R. (2010). Beyond feedback: Developing student capability in complex appraisal. *Assessment & Evaluation in Higher Education*, **35**, 535–550.

Sadler, D. R. (2009). Transforming holistic assessment and grading into a vehicle for complex learning. In G. Joughin (ed.) *Assessment, learning and judgement in higher education*. Dordrecht: Springer. (Ch. 4, 45-63).

Wittgenstein, L. (1953). *Philosophical investigations* (Anscombe, G. E. M., trans.). Oxford: Basil Blackwell.