

Flipping Feedback

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A common concern amongst undergraduate and taught postgraduate students is that feedback on their work comes too late to be useful or useable. This Briefing explores how university teachers can 'flip' or reverse that retrospective focus by opting instead to give feedforward, 'real-time' or embedded feedback.

Why Flip Feedback?

Feedback 'loops' are a pervasive part of contemporary life. They help students to learn, athletes to excel, cars to run smoothly, crops to thrive, and our brains and bodies to perform a range of everyday functions. A feedback loop, as commonly defined, consists of two closely interwoven steps. The first (to use a medical analogy) is *diagnosis*: an evaluation of how well something is being done. The second is *remediation*: action to narrow the gap where performance falls short of what is expected or required. This second step 'closes the feedback loop'.¹

In higher education, feedback of a formal kind commonly focuses on a task the student has been formally set (a coursework assignment, an exam answer). Diagnosis is typically the teacher's responsibility, and takes the form of evaluative comments that point out strengths and weaknesses together with a mark or grade that signals the overall standard achieved. The onus generally falls to the student, however, to close the feedback loop by taking any remedial action that may be necessary to address shortcomings and achieve or sustain a given level of performance.²

At doctoral level these twin steps are generally tightly interlocked. The supervisors discuss with the student their evaluation of work-in-progress (a research design, a draft chapter section, an initial analysis of data) and how it might be taken forward. The student then goes away to develop and refine the material in the light of the discussion, prior to the next supervision meeting, where another feedback loop is set in motion.³

In contemporary undergraduate education, by contrast, the two steps can be much more loosely linked, with no obvious closure of the feedback loop. The tutor's evaluative comments typically come after the written task has been completed, and without an opportunity for the student to engage with the feedback by asking for clarification or making revisions.⁴ And where the task assessed is submitted at or close to the end of a course, the student may have embarked on a new course by the time the tutor's comments are fed back. What opportunities there will be to put the feedback to good use may not come until late in the following semester, and depend crucially on how much affinity can be found across new subject-matter, differing task types⁵ and widely documented variations in tutors' expectations.⁶

The problem of an uncompleted feedback loop is not confined to coursework assignments. It is also found in everyday learning and teaching, and can be particularly in question in STEM⁷ and cognate subjects where secure conceptual development can depend on each successive step in a chain of understanding being successfully mastered. It may not be until students take an end-

1 See e.g. Askew & Lodge (2000), Hounsell (2003).

2 Sadler (1989), Orrell (2006).

3 Subsequent drafts can also indicate how effectively the feedback had been understood and taken up (Bitchener et al, 2011).

4 See e.g. Vardi (2013), Taras (2006), Orsmond et al (2013).

5 For example, Carless (2006) found that students could not benefit from tutors' comments as they were often too specific to a particular assignment to transfer to other work.

6 Bloxham and Boyd (2007); Vardi (2013); Jessop et al (2013)

7 STEM subjects span Science, Technology, Engineering and Mathematics

-of-semester test or exam that a misunderstanding of an important concept (or uncertainty about how to apply it in an appropriate context) becomes apparent to the assessor – and indeed that ‘diagnosis’ may be relayed to the student only indirectly, via the blunt instrument of a summary grade rather than in the form of a specific observation, with the result that the likelihood of remediation is relatively low.

It may not seem quite so surprising, in such circumstances, that so many students (and especially undergraduates) voice concerns that feedback comes too late to be useful, or focuses too much on shortcomings in a past performance and offers too little advice on how they might do better in the future. And that the issue of ineffective feedback has come so much to the fore in recent years may be a consequence of how mass higher education has typically evolved in many countries of the world. Much larger class sizes, more diverse students, fewer formative assignments, less individual guidance – any or all of these may have contributed to the pervasive perception amongst present-day students in many countries that their learning is not sufficiently well supported.⁸

Thankfully, ways of reclosing the loop by ‘flipping’ or inverting feedback have begun to emerge. All entail fundamentally rethinking where, when and how feedback can best be provided in the much-changed landscapes of contemporary higher education. Three distinct pathways can be identified, all of which put much greater emphasis on feedback as dialogue and interchange.⁹

- a. a shift of focus in comments on assignments from retrospective feedback to prospective feedforward;
- b. a reconfiguration of face-to-face teaching-learning activities to create much greater space for ‘real-time’ feedback loops on students’ understanding;
- c. opportunities to give, get and respond to feedback which are embedded in the warp and weft of students’ everyday experiences of learning and studying.

In each case, the effect is to boost considerably the potential of feedback to make a real difference to the quality of students’ learning.

a. Feedforward on Assignments

The coming of word-processing has enabled students to develop and revise their work with a facility and speed that was never possible when assignments were written by hand or keyed into typewriters. Feedback comments need not therefore come ‘after the fact’ or be solely ‘for future reference’ but can be

put to direct and immediate use. An additional benefit is that students gain practice in learning how to edit and revise — skills that are valuable in a range of graduate professions.

Possible approaches to feedforward include:

- *Draft-comment-revise-resubmit*. The teacher gives comments on the initial submission by the student of an assignment plan or proposal, an extended summary, or perhaps the opening page or section of an essay or report. The student then has the opportunity to revise and complete the assignment in the light of the ‘feedforward’ before submitting it for formal assessment. From the outset, it is made clear to the students that there is to be a trade-off (if the teacher is not to double his or her assessment load). Feedback has become chiefly prospective rather than retrospective, and any later comments that accompany a mark on the final draft are likely to be correspondingly brief, perhaps alongside ratings against the core assignment criteria or whole-class feedback.
- *Parts-to-whole*. Feedforward is given on designated parts of a larger work-in-progress. In first and second year courses, this might focus on successive steps in a larger assignment (the literature review or methods section, perhaps, followed by data analysis and presentation of tables and figures, and lastly the conclusion). For a more substantial capstone project or dissertation, however, feedforward could be given on, for instance, one or two draft chapters of students’ own choosing.
- *Presentation-paper*. A student’s oral presentation to a class represents an initial consideration of a theme, or a summary of the outcomes of a project. Comments are given by the tutor and fellow-students, and feed forward into the subsequent written paper.
- *Chaining and threading*. Rather than providing pre-submission comments, this strategy focuses on maximising students’ subsequent engagement with tutors’ comments. Students submit ‘cover sheets’ with their assignments that indicate how the new assignment has addressed comments made on the preceding one.

b. Real-time Feedback on Students’ Understanding

In mass higher education, with its typically much larger classes and more diverse student intakes, monitoring how well students have understood an important new concept has become more difficult to accomplish yet ever more necessary. A prominent emerging trend, however, is towards creating more effective opportunities both to take stock of the

⁸ Hounsell (2007), Nicol (2010)

⁹ See also Briefing 10, *Feedback as dialogue*, by David Carless

quality and incidence of students' understanding, and to provide 'real-time' or at least near-immediate corrective feedback and guidance. Three approaches can be identified.

Bootgrit feedback. The most straightforward of these is 'bootgrit' feedback, where at the conclusion of a lecture students are invited to ask, confidentially, for clarification or further guidance:

The idea is to resolve misunderstandings or knowledge gaps that might not initially seem serious, but if left unresolved could 'worry away' at the students' learning in a negative way - like a bit of grit in a boot.¹⁰

An explanation, or follow-up guidance, is then provided by the lecturer in a round-robin email or posted on the course website.

Bootgrit feedback is simple and virtually cost-free to implement, and is said to work best in contexts where lectures are viewed 'as places where students and lecturers can interact with interesting ideas and challenging knowledge'.

Clickers. The use of 'clickers' — more formally referred to as classroom response systems (CRS) or student response systems (SRS) — is becoming increasingly commonplace in undergraduate teaching. Clicker technology will be familiar to anyone who has watched TV quiz shows such as *Who Wants to Be a Millionaire*, or the film *Slumdog Millionaire*, in which members of the audience select one of a fixed number of possible answers to a question by clicking the relevant button on a handheld remote device. The technology captures their responses and displays on screen what percentage of the audience opted for each response.

In undergraduate lectures, the same technology can be used to put to an entire class questions designed to test how well the students have grasped a recently introduced key concept. Any embarrassment over not getting the answer right is avoided, because individuals are not identified, but each student does of course very quickly find out whether they had understood correctly, and the information on how many students got the answer right determines whether or not the lecturer opts to provide further explanation¹¹. Remediation can also come through what has been called peer instruction¹², where students review their respective answers in small group discussion before re-voting.

As a practical guide to clicker use makes clear:

Once an instructor has embraced the idea of interactive teaching, having good questions is the single most important element for having a successful class using clickers. Ideally you would like a question that students will interpret properly and will see as interesting and challenging, will stimulate students to want to hear and analyze the ideas of their classmates, will shape student thinking in desired ways, will reveal unanticipated student difficulties or interpretations, and will accurately reveal whether or not students are mastering the material. However, a question can be more than adequate without achieving all these goals, and it is hard to predict which questions will be great until you try them.¹³

The use of clickers is most widespread in the natural sciences¹⁴ and technology¹⁵, but examples can also be found in subjects such as Business and Management Studies¹⁶ and Political Science¹⁷. A tripling of learning gains is claimed for its use in Physics at Harvard and other US universities.¹⁸

The flipped classroom. There is no hard-and-fast boundary between clicker-based peer instruction and what has come to be called the flipped classroom, especially since many of the pioneers of the former have become exponents of the latter. However what chiefly characterises the flipped classroom, in its diverse guises¹⁹, is that the transmission of information shifts from inside to outside the classroom, and is undertaken by students prior to attending the relevant class, whether via study materials or video screencasts. In-class contact time is used primarily for active and interactive learning activities such as problem-solving in peer groups, and may be followed up by assigned post-class activities to consolidate what has been learnt²⁰. In consequence, as Lancaster has observed:

The academic is freed from the constraints of having to work through the content and can use a variety of technology-facilitated strategies to maximise engagement, probe understanding and ensure students are able to apply the knowledge effectively.²¹

Bates and Galloway make a similar point about the transformation of the teacher's role:

We spent as much time halfway up the raked steps of the lecture theatre as behind the bench at the front. We created an environment, largely through clear

10 McArthur et al (2011)

11 Dangel & Wang (2008)

12 Crouch & Mazur (2001)

13 Wieman, C. et al. (2009)

14 For a Chemistry example see Lancaster (2013); in Physics, Birch & Walet (2008); in Bioscience, Caldwell (2007).

15 Cranston & Lock (2012); Sellahewa (2011)

16 Heaslip et al. (2014)

17 Damron & Mott (2005)

18 Mazur (2009)

19 Some accounts of flipped teaching, it should be noted, emphasise the use of video and other technologies, make no use of clickers, and put active and collaborative learning (rather than surfacing and addressing students' misconceptions) to the fore. See e.g. Herreid et al (2014); Forsey et al. (2013)

20 See e.g. Abeysekera & Dawson (2015)

21 Lancaster (2013)

expectation setting from the very first lecture, where people would volunteer comments and suggestions, not just from 'the usual suspects', and without being crippled by the fear of getting something wrong.

It is an exhilarating feeling to be freed from the tyranny of content coverage to be able to have the time and space to focus on what really matters: whether or not students actually understand the material.²²

c. Embedded feedback

In many course settings, the provision of feedback on students' progress and performance is to a considerable degree formalised, focused wholly or mainly around assignments and assessments, and thus occurring in relatively isolated pockets of time. But in some instances, feedback to students is what Laurillard has called 'intrinsic' rather than extrinsic.²³ Feedback is less a clearly demarcated and relatively conspicuous event, and more something ongoing and *embedded* into virtually every aspect of the day-to-day transactions of learning and teaching.

One long-standing instance of embedded feedback is to be found in the practicum or studio-based model of learning that typifies architecture as well as art and design. In these fields there is almost always work-in-progress, and it proceeds from day to day semi-publicly, in the open spaces of the studios, workshops, or ateliers. Questions, comments, observations, interactions can take place at almost any time, in largely informal ways, and involve teachers, or fellow-students.²⁴ Even where feedback opportunities are more formalised, as in the 'crits' (critiques) common in studio-based subjects²⁵, the other students in the same group see the work being critiqued, and hear the teachers' comments and questions on it as well as whatever response is made by the students whose work is under scrutiny. And whether they are engaged in producing individual or collaborative pieces of work, students are learning with and from one another as well as in interaction the teacher, and sometimes vicariously²⁶ as well as directly and personally.

In a recent article, the authors invite readers to contemplate a situation in which key features of the design studio-based learning were to be replicated elsewhere in the humanities and social sciences²⁷:

Imagine a composition or history class meeting for six hours a week, with students doing most of their

written work on site as the instructor floated from desk to desk to review the student works in progress and offer feedback. These longer class sessions could devote time to more frequent formal and informal review activities (or 'crits'), and the extended contact hours and workshop atmosphere might strengthen the relationships and trust among students and between the students and the instructor.

Yet direct replication of the studio model seems neither desirable nor necessary, since good examples of embedded feedback can already be discerned across the curriculum in forms that retain their disciplinary authenticity, as is demonstrated in many of the case examples in Wise Assessment Briefings 9 (*Informal Feedback*) and 10 (*Feedback as Dialogue*). Whatever the discipline, it is argued here, the most productive way forward would lie in identifying ways of emulating, within specific courses, at least some of the key features of embedded feedback, where these are not already present. These key features, it is suggested, are as follows:

- A premium is placed on creating feedback opportunities which have *immediacy*: feedback is generated as close in time as possible to the task or activity to which it relates
- Wherever and whenever possible, feedback is given on tasks and activities that are ongoing, i.e. on work-in-progress, so that it can promptly be put to direct use
- Feedback is provided not only formally (e.g. via written comments on assignments) but also informally, where it can be generated in situ and 'in the moment'
- Feedback does not just come from the teacher, but also through students' engagement in tasks which are pursued collaboratively as well as individually, where work is on open display and where students learn from and with one another.

As is apparent in course descriptions from the undergraduate years onward²⁸, the new digital technologies – and especially social software such as group wikis and blogs, together with video and other multimedia – are already helping to facilitate this quiet revolution in feedback²⁹.

22 Bates & Galloway (2012)

23 Laurillard (2002)

24 As Schön (1987) has observed, "the work of the practicum is accomplished through some combination of the student's learning by doing, her interactions with coaches and fellow students, and a more diffuse process of "background learning".

25 See e.g. Dannels & Martin (2008)

26 Chi et al (2008).

27 Schrand & Eliason (2012)

28 For a wealth of examples, see the Wise Assessment Briefings 1-3 on *Assessing in Common Core Courses*.

29 See e.g. O'Shea & Fawns (2014)

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