The role of assessment and feedback in promoting learning

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Outline

Introduction

What are the problems with assessment? What does assessment need to do?

Part 1. Rethinking and redesigning feedback for greater impact on learning

Part 2. Developing evaluative judgement within courses

Your issues throughout

The (un)desirable impacts of assessment on students

Most assessment has a strong impact on learning

• But, often it is not what we desire

Making a positive impact is very challenging

Assessment tends to work *against* prompting the learning we want



What impacts are evident?

Assessment:

- gives a message to students about what we value
- prioritises some learning outcomes, ignores others
- encourages rote learning, discourages deep approaches
- poorly distributes study time across the semester
- inhibits cooperation and collaboration between students
- over-emphasises some communication skills (eg. writing with a pen) at the expense of others
- distracts students from the object of study through a focus on marks

Is assessment fit for purpose?

- Does it do what we need it to do?
 - What are these things?
- How well does it presently do it?
 - What negative consequences are there?

Having clear conceptions of assessment is more important that understanding particular methods and techniques

What is the assessment of students supposed to do?

What does assessment always need to do?

Ensure	Provide	Build	
Ensure that learning outcomes have been met • Summative assessment	Provide students with useful information to aid learning now • Formative assessment	Build students' capacity to judge their own learning • Sustainable assessment	

Australian standards

'These Standards represent the minimum acceptable requirements for the provision of higher education in or from Australia by higher education providers registered under the TEQSA Act 2011.'

'1.4 Learning Outcomes and Assessment

• • •

The expected learning outcomes for each course of study are specified, consistent with the level and field of education of the qualification awarded, and informed by national and international comparators. $\begin{bmatrix} 1 \\ SEP \end{bmatrix}$

Methods of assessment are consistent with the learning outcomes being assessed, are capable of confirming that all specified learning outcomes are achieved and that grades awarded reflect the level of student attainment.

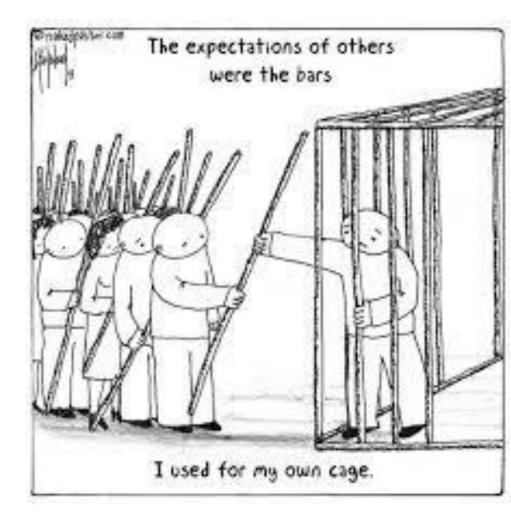
What is assessment (in the context of learning outcomes)?

- Judging whether students can demonstrate attainment of learning outcomes to a given standard.
- Transparent standards must be established for assessment tasks
 - Setting a pass mark is not setting a standard!
 - Setting a general set of standards for all modules/subjects is not enough
 - Use of terms such as good, superior, excellent does not indicate a standard or communicate a level
- All assessment must be standards-based
 - Norm-referencing (judging students against each other) is banned



Assessment is relational

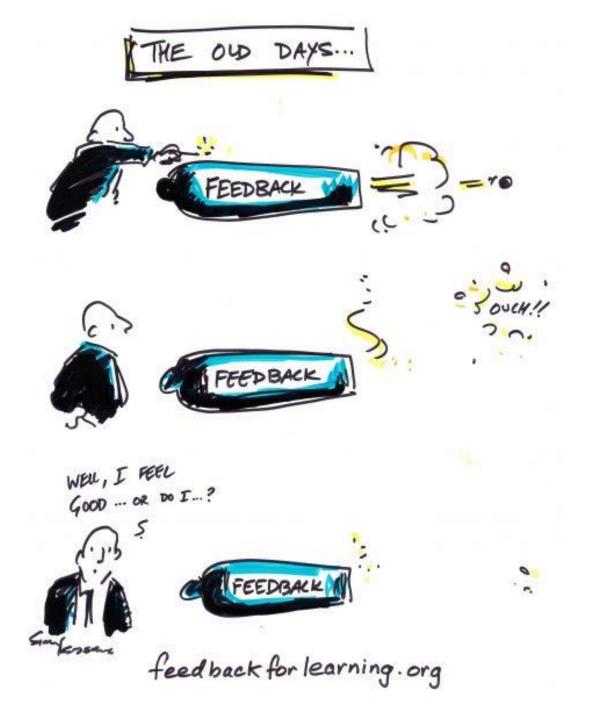
- How students respond to assessment is only partly influenced by the task and method used
- Responses are powerfully influenced by previous experience and expectations
- This limits our assessment design choices



Part 1. Rethinking and redesigning feedback for greater impact on learning

What is feedback supposed to do?

Challenging old ideas about feedback



The problem with feedback

- Learners complain that they do not get enough of it
- Both parties describe it as confronting
- Both parties agree that it is very important
- Educators resent that although they put considerable time into generating feedback, learners take little notice of it
- Educators typically think their feedback information is more useful than their learners think it is
- Feedback is typically 'telling' and diagnostic in flavour, often lacking strategies for improvement, and often lacking opportunities for further task attempts

Is this a helpful or unhelpful idea?

Feedback =

information provided to students by educators about learners' work.



This is not feedback

"I left feedback on their final essays, which they never collected"



An important distinction

Mark (or grade) justification

- Judgements and comments about past work students have completed
- Essentially backward-looking

Feedback information

- Comments about what students can do to improve future work
- Essentially forward-looking

The project: "Feedback for Learning: Closing the Assessment Loop"

Asks

"What works, when, and why?"

and

"What is enabling excellent feedback?"

Large-scale, mixed-methods study

- Informed by literature and expertise from team, evaluator and reference group
- Producing workshop materials, cases of effective feedback and a framework

feedbackforlearning.org

Feedback definition

"Feedback is a **process** in which **learners make sense of information** about their **performance** and **use** it to **enhance** the quality of their **work** or **learning strategies**."

feedbackforlearning.org



Generations of feedback thinking

Feedback Mark 0 Conventional. Pre-feedback

Feedback Mark 1 Behavioural. Closed

Feedback Mark 2 Agentic. Open

Evolution of feedback designs: Mark 0

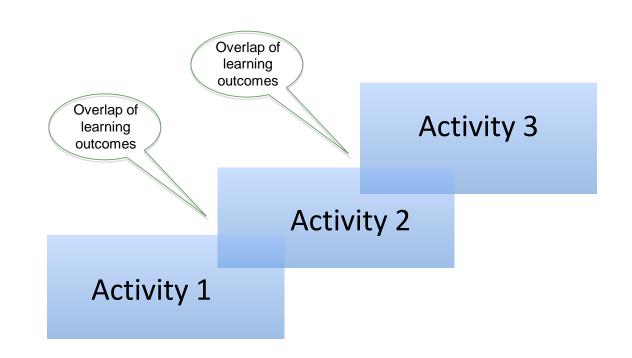
- Hopefully useful information
- Given/done to receivers
 - "The lecturer gave feedback to the student"
- On completion of their work

(Boud & Molloy, 2013)



Evolution of feedback designs: Mark 1

- Hopefully useful information
- Given/done to receivers
- Sequenced to require improvement
- Given in time to allow for improved work



Can Feedback Mark 1 solve all our problems?

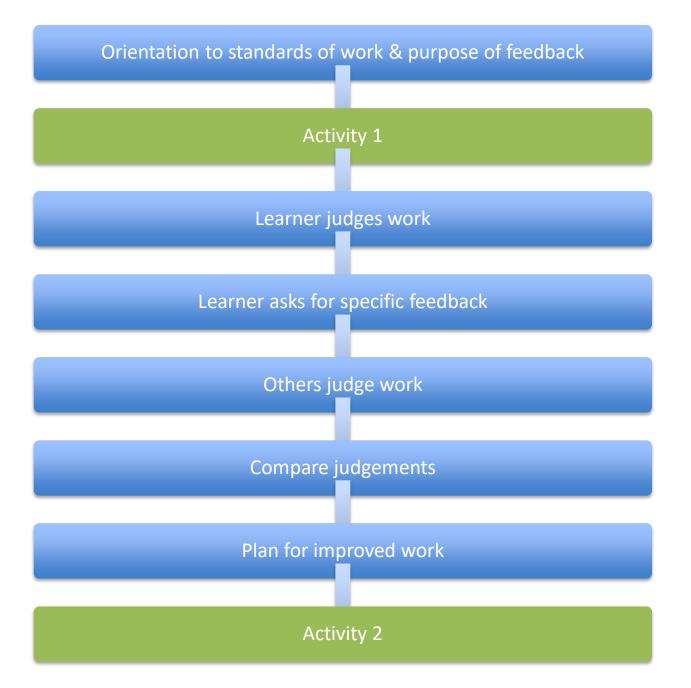
Difficulties with Feedback Mark 1

- The teacher is the driver and needs to continually provide comments and monitor the situation
- The learner is dependent on the teacher to generate what they need to learn
- It is not *sustainable* assessment. It doesn't equip the learner to learn beyond the immediate task or course

Evolution of feedback designs: Mark 2

- Feedback Mark 1 (ie. noticing student actions) plus:
 - Dialogic
 - Participatory and agentic
 - Peers, self, experts
 - Focus on change
 - Development of evaluative judgement

Example of Feedback Mark2



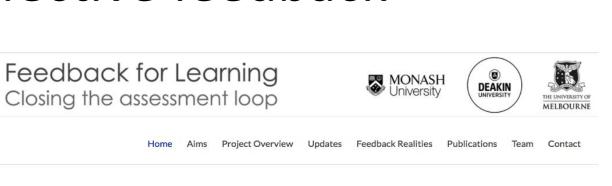
	Feedback Mark 0	Feedback Mark 1	Feedback Mark 2
Approach	Conventional	Behavioural/cognitive	Agentic
Locus	Teacher initiated	Teacher-driven	Learner-driven
Features	Taken-for-granted act of teacher/assessor	Closed system Classic feedback Tight loop	Open system Adaptive/responsive
Location	At end of teaching sequence	During learning	During learning and beyond
Effects	Effects not detected directly	Effects closely monitored by teachers	Effects monitored by teachers and learners
Learner involvement	No student involvement needed	Student involvement in response to specific stimulus	Student engagement intrinsic to process— dialogic
Information provided	Information provided not influenced by effects	Information provided changes in response to immediate effects	Information provided changes in response to effects
Goal	Study improvement	Task performance improvement	Judgement performance improvement
Feedback loop	None explicitly	Single loop	Double loop

Some issues arising from students (n=4514)

- 1. Students want to improve their work and not just get marks
- 2. Think about turn-around time for comments in terms of the next task
- 3. Rubrics alone are not enough for feedback
- 4. Focus on the design of a feedback process, not just comments
 - a) Follow-up tasks
 - b) Build people other than teachers into feedback designs
 - c) Consider: what kind of comments can be used by students to improve their work?
- 5. Spend time on building students' feedback literacy

Case studies of effective feedback

- Surveys and focus groups with educators and students identified cases where feedback was working well
- In-depth interviews with multiple teaching staff and students to understand what is working well and why
- Cases are useful exemplars of effective feedback – but also the lessons learnt in enabling feedback





Assessment feedback is critical to effectively promote student learning. It is the lynchpin to students' effective decision making, and the basis of improved learning outcomes. However, feedback is under-utilised and often misunderstood by both students and educators and there is no single feedback strategy or model that has been shown to work across all contexts. The Australian Higher Education sector is in need of a useful and useable approach for improving feedback to promote student learning and experience.

We have a surfeit of models, frameworks, principles and strategies in the considerable expanse of literature exploring feedback, yet we have little guidance on how to choose amongst them. As such, our project aims to enhance student learning and experience by improving institutional, educator, and student capacity to stimulate and leverage assessment feedback.

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Case studies of effective feedback

- 1. Developmental and diverse feedback: helping first-year learners to transition into higher education
- 2. Personalised feedback at scale: moderating audio feedback in first-year
- 3. In-class feedback: a flipped teaching model in first-year
- 4. Authentic feedback through social media in second year
- 5. Layers and loops: scaffolding feedback opportunities in first-year biology
- 6. Multiple prompt strategies across contexts: feedback in classroom, lab and professional practice
- 7. Investing in educators:

enhancing feedback practices through the development of strong tutoring teams

The context of problem-based learning

- Advantages for feedback processes
 - Multiple feedback cycles are possible (at least one for each problem)
 - Peer feedback is already legitimated in PBL
- Challenges for feedback in PBL
 - Where is feedback information documented/recorded?
 - Opportunities for expert input may be limited
 - Acting on information needs to be a conscious part of the process, not taken as given
 - Accommodating individual rather than group feedback

Digital enablers of feedback

- LMS can be set up to hold students' work, feedback information and responses to it
- Tracking of inputs and actions over time is facilitated
- Visual building towards meeting course/program learning outcomes is possible
- Portfolios can be used to managed all aspects of assessment, reflection and response

Key points about feedback

- Feedback provides one of few ways in which courses are tailored to the individual needs of students
- Feedback processes need to be carefully designed
 - Giving comments to students is *only one part* of a feedback process
 - Without active involvement from students, feedback can't work
 - Unless the loop is completed, feedback has not occurred
- Feedback should be judged in terms of its effect on student learning

Ten feedback strategies to make a difference

- 1. Build in a following task in which students can apply feedback info from the first
- 2. Have students identify and state what kind of comments they would like
- 3. Have students respond to feedback information with a plan for what they are going to do about it
- 4. Have students judge their work against criteria or a rubric before they hand it in
- 5. Facilitate peer feedback sessions
- 6. Distinguish between mark justification and feedback information when making comments
- 7. Move detailed feedback comments from late in the semester to earlier when students can act of them
- 8. Focus on comments for improvement rather than corrections
- 9. Point to models and exemplars of good work

10. Train students to be feedback literate (ie. What feedback is and how they can make it work)

Draw inspiration and find many more strategies from the case studies of excellent practice at *feedbackforlearning.org*

David Boud and **Elizabeth Molloy** (Eds)(2013). Feedback in Higher and **Professional Education:** Understanding and Doing it Well. London: Routledge

Feedback in Higher and Professional Education

Understanding it and doing it well

Edited by David Boud and Elizabeth Molicy

Implications for work-contexts

- Feedback involves a personal understanding between recipient and provider
- Providing unsolicited feedback is an act of exercising power over the other
- Building of trust of a pre-requisite for a feedback relationship
- Building such relationships is necessary for learning at work

The feedback contract

- Feedback only works through trust and mutual understanding
- Providing unsolicited feedback information is commonplace in education but can be offensive elsewhere
- What is the warrant for providing information to another person?
- What kind of permission is needed for what purposes?
- Knowing the goals/expectations of the recipient is a necessary feature

The Learner Feedback Literacy Framework

A learner exhibiting well developed feedback literacy:

- Section 1: Commits to feedback as improvement
- Section 2: Appreciates feedback as an active process
- Section 3: Elicits information to improve learning
- Section 4: Processes feedback information
- Section 5: Acknowledges and works with emotions
- Section 6. Acknowledges feedback as a reciprocal process
- Section 7: Enacts outcomes of processing of feedback information

Section 1: Commits to feedback as improvement

1. Establishes a disposition to use feedback to continually improve their work

2. Acknowledges that mastery/expertise is not fixed, but can change over time and context

1.1 Establishes a disposition to use feedback to continually improve their work

"So anytime that there is actual feedback, I tend to take it on board. So it is not like - I don't say, "Oh I'm going to change my behaviour because this one comment hit me hard somehow". It is more, 'Okay, so obviously I've got something here that is deficient. I need to remedy that and then I'll do it' "

D_UG_STEM

Section 2: Appreciates feedback as an active process

3. Acknowledges the role of feedback processes in improving work and refining judgements and learning strategies

4. Recognises that effective learners are active in identifying their own learning needs

5. Anticipates their own learning needs and communicates these to appropriate others

6. Understands the role of standards and criteria in judging the work of oneself and others

7. Identifies that they need to complete a feedback loop for information provided by others to be effective

8. Recognises that feedback should build capacity to develop their own evaluative judgment over time and over different learning outcomes

2.7. Identifies that they need to complete a feedback loop for information provided by others to be effective

"I think it's helpful when the first assessment task kind of helps with the second one. Where they're two different formats, you don't really have another chance to improve what you've been given to work on. I had a lab report in our first assignment was to just write the introduction, and submit that. And we got feedback for that. And then the last assignment was to submit the whole lab report. So you actually had the chance to include the feedback and, like, my comments had noted that they could see I had taken the feedback and applied it, which was good to see that that works."

D_UG&PG_Health

Section 3: Elicits information to improve learning

9. Realises that feedback requires active elicitation and does not wait for others to provide unsolicited information

10. Uses a wide repertoire of strategies to elicit appropriate information from others to assist learning

11. Considers feedback from multiple sources—eg. teachers, peers, practitioners— to provide a different scope and opportunities for learning

12. Recognises that different stakeholders may have different perspectives, experience and levels of investment in the process

13. Engages in dialogue to elicit useful information about standards, criteria and the nature of good work

14. Seeks out exemplars as a way to make sense of standards of work15. Seeks cues from the environment and the task itself that indicate the appropriateness of work

Section 4: Processes feedback information

16. Identifies and utilizes standards, criteria and exemplars

17. Recognises and interprets language peculiar to education containing important cues about the task or related outcomes

18. Selectively accepts and rejects views of others in coming to their own appraisals 18.

19. Extracts key actionable information from others, which may require prompting for more detail or clarity

4.16. Identifies and utilizes standards, criteria and exemplars

"I was very happy with the unit because we got constant feedback and also sample answers like it contained what the tutors were expecting from us, like kind of an answer they were expecting. So, apart from feedback, I think it's always better to have something in hand to look at to improve on it, but they also help us improve by looking at the sample."

D_UG_non-STEM

Section 5: Acknowledges and works with emotions

20. Demonstrates volition and sensitivity in approaching others to elicit suggestions and to continue dialogue with them as needed 21. Demonstrates openness to receiving comments from others without displaying defensiveness 22. Builds trust in facilitating honest and meaningful information exchanges with others 23. Recognises that information comes in different modes with different capacities to mobilise emotions, eg. individual and group, written and through various other media, structured and informal 24. Manages the emotional challenges of receiving and sifting information which may be unwelcome or misjudged 25. Considers the influence of high stakes assessment on the way learners might engage in candid dialogue about their own performance

Section 6. Acknowledges feedback as a reciprocal process

26. Recognises that they have roles as both user and provider of information and that skill in one role helps in the other
27. Composes useful information for others about the nature of their work
28. Exhibits cultural sensitivity through not assuming that others are

28. Exhibits cultural sensitivity through not assuming that others are likely to react in the same way as oneself in receiving and responding to information

Section 7: Enacts outcomes of processing of feedback information

29. Responds to feedback information from others through goal-setting and planning how it might be utilized in future work

30. Analyses and records information in appropriate forms for the purposes of acting on it subsequently

31. Monitors their own progress to discern where feedback might be helpful and to influence the setting of new learning goals

Using the framework

- Develop elements of feedback literacy in core first year courses
- Position students as active learners through all feedback activities
- Identify why some students don't seem to benefit from feedback comments
- Develop an instrument to enable development of feedback literacy to be tracked over time

Challenges for feedback literacy development

- Seeing feedback as the business of learners (and soon to be, employees)
- 2. Shifting the perspectives of teachers from 'information providers' to facilitators of learner feedback literacy
- 3. Working with, and managing affect, as part of feedback
- 4. Creating pedagogical designs to promote feedback literacy

Alternatives to written feedback comments

There are many modes for feedback comments with various pros and cons:

- Group comments
 - Students don't see these as feedback
 - Not oriented to individual needs
- Face-to-face
 - No time to do this for everyone
 - The wrong students benefit when it is offered
- Video (or audio) comments
 - More personal and nuanced that written
 - Saves time
- Screencast plus audio comments
 - Needed for technical/visual assignments



Part 2. Developing evaluative judgement within courses

Developing evaluative judgement

- If students can't judge the quality of their own work, how can they learn effectively?
- If graduates can't judge the quality of their own work, how can they practice effectively?
- If they can't help each other judge the quality of their work, how can they work effectively with each other?

The problem of (all) work

When confronted with a new challenge, how do we know if we are doing well or not?

How do we know if we are working well?

- Look for examples of good work of a similar type
- Ask peers/co-workers
- Identify the basis on which you will be judged (protocols, contracts, specifications, etc.)
- Show samples to others
- Consult documentation
- Ask experts
- Ask one's line manager!

Evaluative judgement is:

the capability to make informed decisions about the quality of work of self and others



Why is it important?

- Being able to judge the quality of one's own and others' work, is necessary for lifelong learning
- It underpins students' capacity to engage in feedback conversations, through a better understanding of standards
- It promotes holistic and explicit understandings of quality
- It is a precursor to the development of expertise

Surely, self and peer assessment is enough?

- Not when it is misused and misunderstood, as it frequently is
 - Not about students grading themselves and each other, but about identifying appropriate criteria and applying them
- When we give students incentives to distort their judgements we shouldn't be surprised when this happens
- There is a much bigger issue at stake than marking

Why a new frame?

- Focuses attention on what graduates need to be capable of, no matter what their course
- Positions assessment as an act to inform students judgement, not one which makes unilateral decisions about students
- Uses educational rather than psychological language to describe a located practice

Don't we all do it anyway?

Yes, but:

- It is often not an explicit focus
- It is rarely a systemic focus
- It gets distracted by the fragmentation of the curriculum, multiple placements, etc.
- Many existing teaching, learning and, particularly, assessment practices inhibit it

What do we do now to promote development of evaluative judgement?

Steps towards promoting students' informed judgement

Element 1 Identifying one's self as an active learner

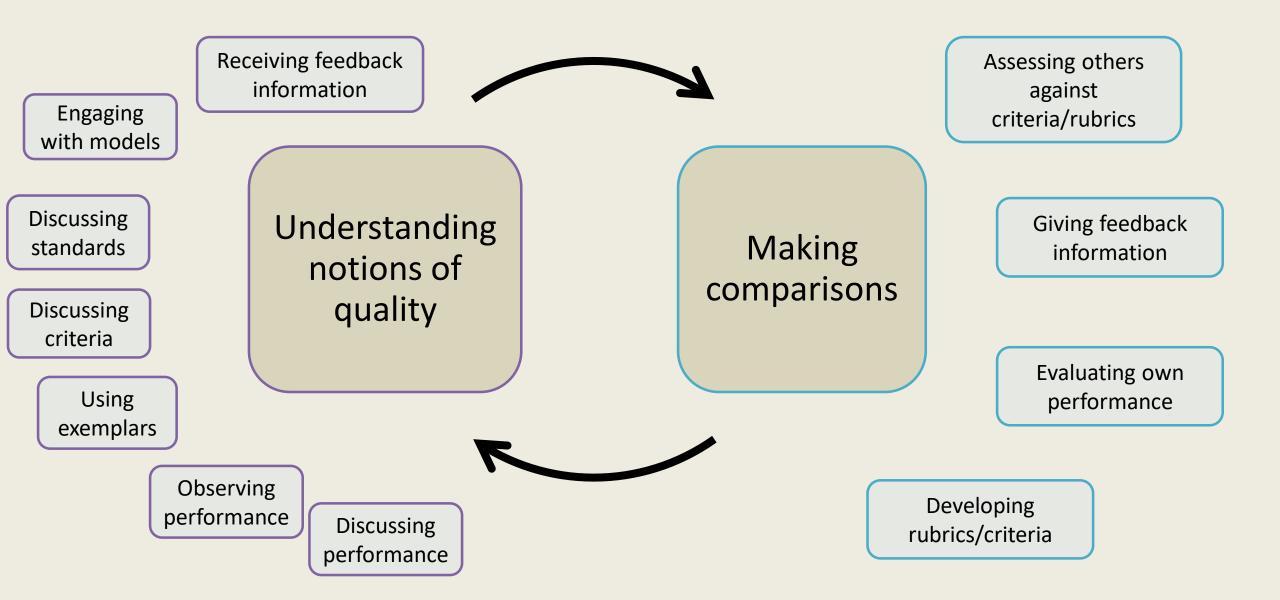
- Element 2 Identifying one's own level of knowledge and the gaps in this
- Element 3 Practising testing and judging [and using feedback]
- Element 4 Developing these skills over time
- Element 5 Embodying reflexivity and commitment

Boud & Falchikov 2007

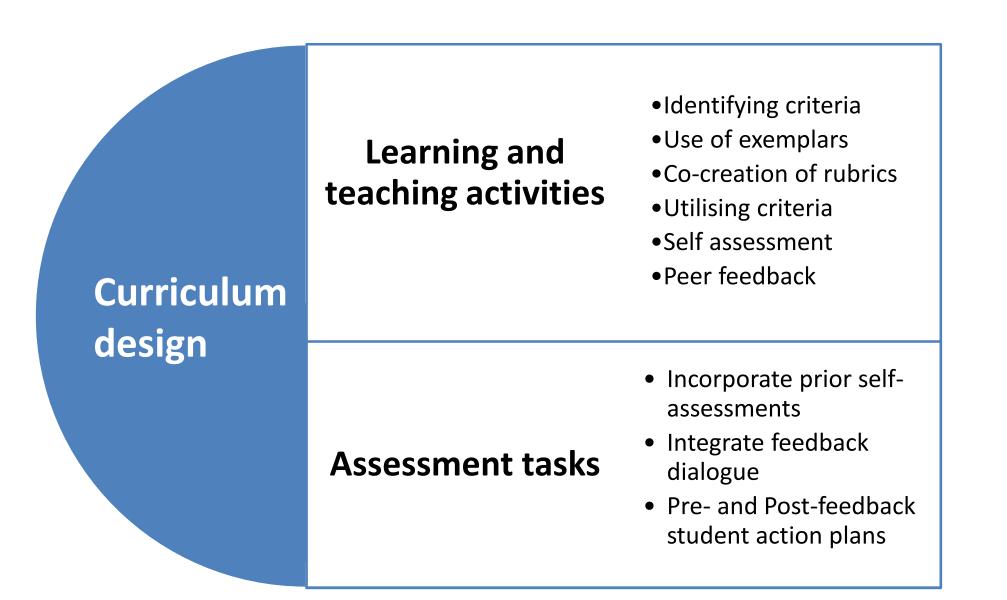
Features of evaluative judgement

- 1. To make a judgement about quality you need an understanding of quality
- 2. Recognition of a standard (implicit or explicit; individual or community)
- 3. A desire, opportunity or habit developed in learners for making these judgements as a way of *being* that is contextual, social and cultural
- 4. Requirement to articulate and justify these judgements iteratively contributes to understandings of quality

Integral components of evaluative judgement



How can we develop it in our students?



What is not likely to be effective?

- Single interventions in individual course units
- Practice without feedback on effectiveness of judgement
- Developing it in one knowledge domain and assuming it transfers to others
- Delay until students know more, are more advanced, more mature, etc.
- Focusing only on the judgement itself, under-emphasising appreciation of standards and criteria of quality

An example:

Assignment with added evaluative judgement features

Before assignment commenced

- In class: nominal group identifying features of the assignment done well
- Assignment attachment sheet created with these as criteria

Once assignment complete but before submission

- Student gets input from a peer and revises assignment as needed
- Student identifies and records how well their assignment addresses the agreed criteria

Post submission

- Feedback information from teacher focuses on discrepancies between student and teacher judgements using the agreed criteria as a focus
- Student constructs an action plan which focuses on areas needing development

Main elements of the example

- Students engage with criteria and standards ahead of generating work
- Students get inputs from others about their actual work
- Students calibrate their judgements against those of others
- Response to comments is expected
- Next assignment enables previous feedback to be utilised



Pedagogical practices that, if designed suitably, can develop evaluative judgement

- Identifying standards and criteria not just those provided
- Feedback

to help learners' calibrate their judgements

• Rubrics

co-creation with learners

• Self assessment

using criteria, over time, over tasks

• Peer feedback

Qualitative, without grading

• Exemplars

dialogue about multiple and contrasting examples

Curriculum practices that can aid development of evaluative judgement

- Assessment of learning outcomes
- A programmatic rather than a module-centric approach
- Use of curriculum mapping
- Adoption of sustainable assessment throughout
- Embedding evaluative activities within normal tasks and assessments
- Mechanisms for learners to track attainment of outcomes across a program

What is not likely to be effective?

- Single interventions in selected units
- Practice without feedback on effectiveness of judgement
- Developing it in one domain and assuming it transfers to others
- Delaying until learners know more, are more advanced, more mature, etc.
- Focusing on the judgement itself, while under-emphasising the appreciation of standards and criteria of quality

What practices can work in your contexts?

- Joined up ones
- Integrated into normal work

CRADLE suggests ... 'Developing Evaluative Judgement'



What is evaluative judgement?

A key goal of higher education is to prepare graduates who are capable of effective practice. This requires individuals to recognise quality in their own work. This is why evaluative judgement, "the capability to make decisions about the quality of work of self and others" (1, p. 471) is so important. Such judgement can be refined over time and with practice, as students necessarily draw on disciplinary understandings of quality.

The research

The CRADLE team explored how to foster the development of evaluative judgement in university courses and published an open access paper (1), convened an international symposium and produced a book, Developing Evaluative Judgement in Higher Education (2).

Developing students' evaluative judgement

Educators can design and facilitate targeted activities that help students develop their evaluative judgement as part of normal learning tasks:

Identify specific areas that require evaluative judgement development

Evaluative judgement must be developed in context and with respect to particular domains of knowledge. Within each, educators can identify key areas for focus, along with what constitutes quality in them.

Help students learn to discern quality

Quality is often difficult to express. Despite this, tacit notions of quality can be made more explicit through engaging students with standards and criteria, for example by using exemplars, discussion and cocreating rubrics with them. This is best developed across the span of a course.

Foster students' judgement processes

Students need opportunities to practice making evaluative judgements about the quality of their own work and that of others. In the same way that teachers engage in moderation activities, students need multiple opportunities to calibrate their judgements. This can

FIND MORE

 Tai, J., Ajjawi, R., Boud, D., Dawson, P., & Panadero, E. (2018). Developing evaluative judgement: enabling students to make decisions about the quality of work. Higher Education. 76(3), 467-481. https://doi. org/10.1007/s10734-017-0220-3.
 Boud, D., Ajjawi, R., Dawson, P., & Tai, J.

Boud, D., Ajjawi, R., Dawson, P., & Tai, J. (2018). Developing evaluative judgement in higher education. London: Routledge.

occur through formative self- and peer-assessment activities with staff feedback on the quality of students' judgements.

Recognise and manage biases

When students practice making judgements, they need to be assisted in identifying the inevitable biases they bring to bear on them, so they can learn to spot situations in which their judgement is likely to be distorted, e.g. when they judge on the basis of effort expended rather than outcome.

Encourage students to explain their evaluative judgements

Without being able to identify and articulate the qualities of good work students are unlikely to be able to produce it for themselves. Articulation of underlying reasoning processes helps to demonstrate that judgements are made for the right reasons. One way to implement this is through structured group activities where students analyse examples in relation to criteria/rubrics.

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CRADLE Suggests ... series

- Developed from CRADLE research projects
- Series of principles which we are hope are useful for implementation

Centre for Research In

CRADLE suggests is a series of

Research and Assessment in Digital

Learning (CRADLE), which translates

our own research into practice-based

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briefings from the Centre for

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Developing Evaluative Judgement in Higher Education

ASSESSMENT FOR KNOWING AND PRODUCING QUALITY WORK



An agenda for assessment

- Assessment and feedback must be deliberately designed to have a continuing positive influence on student learning. It must leave them being equipped for the future, not judged on the past
- In a outcomes-based world, students must be comfortable in using standards and criteria for themselves and with each other
- Building the capacity to judge ones own work and that of others is the educational outcome on which all others are dependent
- We equip students for the future not primarily through the specific knowledge and skills they acquire but through their capacity to make informed decisions through their own practice

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What constitutes effective comments on students' work?

Hattie's model for feedback comments

- Comments can be directed at four different levels of operation of the student. Feedback will be ineffective if directed at an inappropriate level.
- The responses of students and their efficacy are dependent on the focus and type of comments they get.
- If the focus is inappropriate to their needs, feedback may be ineffective, because the student is unable to transform information into action where it is needed most.

Hattie and Timperley 2008; Hattie and Gan, 2011

Levels of operation at which feedback comments are pitched:

• Task focused

• Process focused

• Self-regulation focused

• Person focused

Levels of operation at which feedback comments are pitched:

- Task focused
 - Most common
- Process focused
 - More effective
- Self-regulation focused
 - Most needed
- Person focused
 - Mostly ineffective

Elements of self regulation focus

- capacity to create 'internal' feedback.
- ability to self-assess.
- willingness to invest effort into seeking and dealing with feedback information.
- degree of confidence or certainty in the correctness of the response.
- attributions about success or failure.
- level of proficiency at seeking help.

Guidance for those offering comments

- Be wary of old nostrums and supposed 'good practice'
- Involve the learner
 - if they are positioned as passive recipients they will act as such
- Think about what you really want to influence
 - It may not be good use of your time to offer simple corrections
- Always do it when students are in a position to act on it
 - Not at the end of a unit!
- Comment as if it were a part of an ongoing dialogue
 - One-off, disconnected input is very unlikely to influence

Key questions for excellent feedback practice

Design:

- are tasks positioned within the course to enable feedback to occur and for students to improve their work?
- Are tasks (and what precedes them) designed to stimulate worthwhile learning? *Inputs to students:*
- Are comments to students designed to lead to specific improvements in their work/learning strategies?

Responses of students:

- Are they expected from the start of the course/task to be active players?
- Are they necessarily expected to respond to and act on inputs from others to produce improved work?

Feedback to teachers

 Are you monitoring students' work with a view to adjusting the course to create bigger positive effects on their learning?

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