CERE slideset 4:
Concepts and Empirical Results in Education

Draft S4

Peer interaction
mgt layer
expectation
Dlog and feedback
Constructivism
Social Constructivism
Read, Discuss, Write
neo-Vyotskian-ism
Catalytic
Feedback

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Laurillard homework exercise from last time.?

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Part D:

1. Peer interaction

2. The "management layer"

Laurillard doesn't grasp how important peer interaction can be for learning
(nor did Vygotsky)

Peers are often important in several ways; but they only occasionally function like the Teacher in the L-model.
One key thing is: peers are often NOT transmitting truth which the other learner converges on.

In L-model, learning and teaching is through the interaction of a learner and a teacher. But in fact there is a much bigger and more complex set of possible relationships of a learner with other people who influence and assist their learning.

Turn now to the big table in the handout and also look to the screen for the next slide which comments on it.

Learners benefit from others with and without special expertise, intention, or being personally known
+ indicates an activity initiated by the learner (proactive-ness)

Helper's expertise	Intention to teach	Personal relationship (contingent action)	Not personal
Unequal, staff, benefit not reciprocal	Intended	Teacher monitoring, Scaffolding of procedural skills + Ask a tutor	Lecturing, Writing a textbook, + Asking an expert
	Unintended	Role model (using a teacher as), (+) Imitating or observing someone more knowledgable whom you know	+ Eavesdropping on strangers, Using a celebrity or hero as a role model, + Studying the career of a politician to gain similar success
Equal, peer, reciprocal benefit	Intended	+ Alternating roles e.g. testing each other, student reciprocal critiquing, The same but imposed by staff	Wikipedia, Anonymised versions of student reciprocal critiquing, + Posting a question to a forum
	Unintended	Peer discussion, + Borrowing lecture notes, + Spying on, imitating, or observing a classmate you know	Anonymous peer review, + Comparing your marks or actions to the class norm, + Listening to classmates' questions and comments, + Mutual help with the process e.g. ask where the classroom is.

The big space of possible relationships between the learner and "helpers"

The table tries to express that all combinations of the following four binary dimensions are common:

A. Gradient of Expertise: the helper may or may not be an expert.

B. Intention: They may or may not intend you to learn.

C. Personal: They may or may not have a personal relationship with you (and so act contingently with you).

D. Learner initiates activities, or not.

(These 4 can also be regarded as 4 dimensions of types of peer interaction.)

1

The "management layer"

The L-model describes the "object layer" of activities that promote learning of the knowledge itself.

Parallel to that is a layer about how those activities are decided on, organised, managed.

A little like: how many student questions are about "admin": when is the lecture, what should I do now, how many questions in the exam, ...)

But also like: how a student decides how many hours to study

And how a student may organise a study group, choose topics for that week's group, ... Email a lecturer and ask for an extra session, ...

See my web document on the management layer (linked to from main CERE page).

The management and object layers mix

The previous table implies that management and object levels mix. I.e.:

One dimension is who helps your learning by providing information and control: peer or T or other person.

Another dimension is who organises your learning: you, peer, Teacher, ... This is the learning management layer.

Cf. contingent tutoring: where the tutor manages the learning by holding the whole activity and its purpose together, as much as by providing content (hints on what to do next)

More peer dims? (2)

A lot of the peer learning literature uses, as contrasts, the terms "cooperation" and "collaboration".

My own view is: there **are** important distinctions to be made.

These words **don't** have any intrinsic difference in meaning; and almost no authors define them, while meaning different things from each other.

Here are 3 distinctions:
a) Joint vs. reciprocal benefit. Share the proceeds vs. exchange different kinds of benefit (as in any purchase or barter).
b) Joint product vs. reciprocal learning benefits.
c) The level of the common thing: aim, goal, actions.
d) Community and identity. Community of learners, of practitioners, ...

More peer dims (3)

How to extend CCI (conceptually constructive interaction) [Miyake, Howe] from 2-person conversations, to multi-person ones; online.

GoogleDocs
Fedwiki.

But does group bonding, community come before or after working together? (Sharif)

Is identity created by being part of a group, or a precondition for it to work well?

Is learning as opposed to doing (joint product) best served by strong social bonds?

More peer dims (4 cont.)

Bale's categories: Perry-meta-information as a prominent part of group interactions, as the group discusses who knows best, who can be trusted about each thing.

Excluding people??

Not having the same "conversation style": a barrier to CCI?

Questions?

1. What don't you understand yet?

2. What is the single most important message / issue here under "the Management layer"?

• Shout out

• Vote

• Correct

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Part E:
Expectation effects in education

Expectations

- Basic effect (punch card training; my microCT exercise)
- **Rosenthal's pygmalion effect of Teacher expectations**
- Draper 2009b paper: an interpretation of learners' self-adjusting decisions (including expectations)
- Dweck (Mueller & Dweck 1998)
- Stereotype threat

    (see http://www.psy.gla.ac.uk/~steve/localed/dweck.html)

Dialogue (and feedback)

Dialogue

Contingent tutoring tells us (among other things) that feedback must be at the right level of detail to be useful for learning.

In Wood's work, this was because the tutor could see from the learner's visible actions and past response to instruction, what that level was at a given moment. In general, this is done by dialogue: by the learner asking questions or their response to the tutor.

In dialogue, you see whether you are understood and correct the communication dynamically — and you don't have to take care to get it right first time.

It is why monologue (e.g. writing) is much harder than dialogue (conversation).

Laurillard's underlying principle of iteration and convergence is an educational version of this.

Dialogue (2)

Applied to feedback, it means it is actually profoundly foolish to produce written feedback: feedback should be given in dialogue. *(class test with EVS)*

Feedback will be much more effective if delivered F2F and with dialogue learner <-> tutor.

It may also be better with peer dialogue as well.

Sharing feedback

Get together with several other learners, and compare the feedback you each got. Generally this illuminates the issues. Or conversely, the tutor creates a comment bank: a set of the common issues.

- See what the tutor cares about (you might have done OK on the issue by accident without realising it was important)
- See if they gave a better or different comment on an issue that concerns you
- Much more economical of tutor time if not 1 but 100 students see each comment. And they are likely to write it more carefully and fully if the comment is only written once (but seen by many)

Giving generic feedback sheets gets this effect (cf. Mike Burton and L3 stats class). Everyone gets to see the issues, and can judge whether they apply to themselves.

Dialogue (3)

Jigsaw: many L-designs that are close to Aronson's Jigsaw design have learners in small groups preparing materials, but then have them "deliver" them to a large group. This suppresses the dialogue. Aronson's design has a single "expert" learner deliver their specialist subtopic in a small group (e.g. 4 other learners). Obviously this is much more likely to promote dialogue between presenter and their audience; and any lack of clarity by the presenter will immediately then be addressed by questions and answers; making successful communication more likely and less dependent on the skill of the presenter. If you really wanted the audience to learn (as opposed to doing a token exercise to promote "presentation skills") then dialogue is important.

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Constructivism
Social Constructivism.

The point is in part to brief you on common theoretical terms (however bad)

And to explain what theory teachers are trained in

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Constructivism: 4 alternative mottos

You can't do someone else's learning for them.
That is why c-tut always adjusts to make the learner construct the last step.

"Learning results from what the student does and thinks and only from what the student does and thinks. The teacher can advance learning only by influencing what the student does to learn." — attributed to Herb Simon
This is why lecturing isn't important, but perhaps designing the learning activities is.

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Constructivism: 2 more mottos

Helping without answering the question
   (?what PAL facilitators are trained to do.)
   "Constructivist teaching": *cf. c-tut*

"If I had to reduce all of educational psychology to just one principle, I would say this: The most important single factor influencing learning is what the learner already knows. Ascertain this and teach him accordingly." – David Ausubel
   Starting points define the journey just as much as the destination does. Prior conceptions strongly affect learning.

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Constructivism (2)

Humans can in fact learn isolated things (nonsense songs, ...): so constructivism isn't quite a universal truth.
But it's extremely wasteful not to build technical learning on previously learned things. So most learning is "bricolage": a handyman's cobbling together of new stuff out of old bric à brac.
Sometimes prior conceptions are wrong: but you still need to track down all those connections, work on what they should be, to stop your spontaneous wrong ideas answering for you.

Either way, constructivism leads directly to the idea that good learning is making as many connections as possible with what you already know: which is my definition of deep learning.

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Constructivism (3)

This is the single most used theoretical buzz word in education, but different people mean different overlapping things by it.
So there's a spectrum from the weakest meaning that almost everyone subscribes to, to radical interpretations.

• Telling alone is inadequate: learners construct knowledge themselves
• Must attend to connecting new ideas to ones existing in the learner already:
   • To prior conceptions
   • To prior experiences (Laurillard public/private)
   • To future experiences (Laurillard public/private)
• Authenticity (connection to real world, to prior motivations)
• PBL (problem based learning)

Contrast to: constructIONism: learning by building stuff yourself?

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Constructivism (4)

So constructivism is always a statement about the learner and the (hidden) mental actions in the learner.

But some would say it is also a statement about what teachers should or must do.

Above all, to button their lips, refrain from telling, just prompt and get the learner to produce / construct the idea. Probably the key thing is say something always one step short of the conclusion you want them to draw: make them work, but work successfully.

Contingent tutoring; prolepsis (it works in rhetoric too); Socratic dialogue.

One of the (many) facets of Chi 2008 is her evidence that whenever the tutor gave feedback (told the answer) learning went down; whenever he got the student to produce explanations themselves, it went up.

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Social Constructivism (5)

The newer buzzword now is "social constructivism".

Again, not enough agreement on its definition or even the issue.

Alternative (NOT identical) candidates for the issue:
- Social vs. individualistic aspects of the learning process [RDW]
- Social vs. individualistic aspects of the grounding of knowledge
- Social vs. individualistic aspects of the source the learner uses.

- Piagetian vs. Vygotskyian accounts of learning
- *Sfard: Acquisition vs. participation metaphors for learning
- (Given that community is seen as an essential aspect): is it seen as consensual, conflictual, or absent except in acknowledging how much our learning "comes from" others. My table (next session) is about this latter.

Probably ALL of these matter, but are not the same as each other (despite a lot of the literature talking as if they were).

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Individualistic (solo, cognitive) **vs. Social**

views on the sources of learning.

See them as rival claims about the bases of learning and knowledge.

Social and asocial views of learning (1)

There is a lot written, much of it confused, about whether learning or knowledge is socially based, or individual. It shows up in catch phrases (seldom defined) such as "social constructivism".

In fact both are true but about different cases, and knowing which applies often matters.

Some knowledge is socially grounded e.g. what one pound sterling is worth, what the name for "London" is in French. People can and do change such things, but no evidence from the material world makes a difference.

Some knowledge is materially grounded: e.g. how far the moon is from the earth and it doesn't matter how many people believe a given distance.

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Social and asocial views of learning (2)

However this distinction actually applies independently 3 times over:

1. The grounding of a bit of knowledge for a whole culture

2. The grounding of a bit of knowledge for an individual with partial knowledege [Putnam]

3. The source of a bit of knowledge for a new learner of it.

In large societies with organised education, the learner's first source is usually social in all cases; but for some knowledge it will shift to a material grounding as they master it.

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Social and asocial views of learning (3)

Probably human groups have always been characterised by a specialisation of mental labour; and this is enormously more pronounced today. So there is usually a social component (deferring to a greater expert) in almost all our knowledge even of materially-grounded knowledge (e.g. distance to the moon).

Another common mistake is to confuse "social" with "sociable". Just because we acquire knowledge from someone does not mean we like them, nor know them, nor were intentionally helped to learn by them. As the large table in session 4 shows: there are many different relationships between teacher and learner; all social as opposed to mechanical; but only some involving a personal and reciprocal relationship.

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Read, Discuss, Write:

the fundamental triad of learning activities?

Read, discuss, write (1)
See one, do one, teach one

I will start with learning a skill (rather than conceptual content).

Here read, discuss, write might be mapped on to:
Watch,
    Do under supervision (i.e. c-tut)
        Instruct (articulate what is done as well as just acting)

The surgeons' slogan about their training is essential that:
    see one, do one, teach one.

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Read, discuss, write (2)

See Francis Bacon (1625).
The suggestion here is that studying (HE type learning) requires
    all of the 3 classic activities, and you have a deficit if you skimp
    any one.
Are modern universities, which require piles of reading and
    writing, skimping on discussion by students?

Peer interaction has many forms (e.g. dancing: which is certainly
    peer interaction).
    Discussion is the one whose learning benefits are established.
Human language has many functions e.g. maintaining friendships.
    Discussion is only one.
Discussion has many sorts.
    Which sort(s) are best for promoting learning?

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Read, discuss, write (3)

Debate vs. "CI"
Winning / persuading vs. advancing one's own understanding.

Some sorts of dialogue have been shown to be associated with
    learning, others not.
Giving the answer to the learner is ineffective,
Giving an explanation (i.e. reasons) is more effective,
Getting the learner to give their own explanation is the most
    effective.

Chi & Bassok (1989)
Chi et al. (2001)
Webb (1988)

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Read, discuss, write (4)

The core argument:

If discussion is added on as an extra activity, then the learning
    gains are well proven.

But the natural sceptical rebuttal is: time on task strongly predicts
    learning, so adding any time will have same effect: nothing
    particular about discussion.

Bacon's argument is that there IS something essential about
    discussion, which more reading and writing cannot achieve.

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Read, discuss, write (5)

We don't actually know a lot about how much or when discussion
    helps. But at times it has been demonstrated to make a big
    difference to learning.

When it does help, it probably works in two ways.

a) Increases certainty, reduces anxiety: if the other person agrees
    with you, you take this as confirmatory feedback.

b) Acts as a prompt to reflection, so you identify, and eventually
    remedy, holes in your understanding. As such, this is acting to
    promote iteration and convergence (principle B underlying
    Laurillard).

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2cc: The two channel classroom (1)

In this class, I attempted to introduce Twitter as a second broadcast channel (independent of the first channel consisting of monologue by me in speech and slides).

- The traditional idea of a lecture is that T broadcasts, and Ls silently process that individually by writing paraphrased notes.
- Thus there is actually a second channel anyway, for any active learning to occur. I.e. attention can NOT be exclusively on T.
- The new feature is that this second channel might be broadcast: so that peers could share their active experience of the lecture in a way likely to promote learning, but not interrupt channel 1.

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2cc: The two channel classroom (2)

Graeme Pate reports that he gets 3 kinds of contribution on the 2nd channel:

1. "Linking": URLs or literature citations
2. "Reinforcing": elaborations ("re-expressions" in the Laurillard model)
3. "Questions": Q&A where a student posts a question and others may answer it.

That is what we saw some of in this class.

It's a way of getting peer interaction in the classroom; but also, of improving interaction (as opposed to only monologue) between L and T.

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"Catalytic" effects on learning by peers, teachers, ...

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Questions:

"Interactive engagement" and "peer instruction" revolve around asking students questions. These may be presented using Electronic Voting Systems (EVS).

But what kind of questions?

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Asking about confidence

Hunt (1982) (in an artificial experiment) showed that participants who first chose an answer and then had to indicate a confidence level learned about 20% faster than those who just chose an answer.

(This general issue is sometimes called "meta-knowledge": when the learner isn't just a recorder of information but reflects on their learning and may modify their learning activity because of this.)

Gardner-Medwin's CBM (confidence based marking) is a direct application of this.

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Mazur's peer instruction

Mazur's peer instruction is a method of teaching that may (but need not) use EVS;
Is grounded in a psychology of how peers aid learning
Is addressed at a long researched principal weakness of his course's particular subject matter (mechanics)

It revolves around a particular type of question that Mazur calls "ConcepTests": basically brain teasers.

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Brain teaser questions

The point is to provoke debate, internal and between peers.
Cf. Socratic questioning, and "catalytic assessment"

Remember the old logo or advert for Levi's jeans that showed a pair of jeans being pulled apart by two teams of mules pulling in opposite directions. If one of the mule teams was sent away, and their leg of the jeans tied to a big tree instead, would the force (tension) in the jeans be:

- half
- the same
- or twice what it was with two mule teams?

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Peer Instruction: Mazur Sequence

1. Concept question posed (brain teaser)
2. *Individual Thinking*: students given time to think individually (1-2 minutes)
3. Students provide individual responses
4. Students receive feedback – poll of responses presented as histogram display
5. *Peer Discussion*: students instructed to convince their neighbours that they have the right answer.
6. Retesting of same concept
7. Students provide individual responses (revised answer)
8. Students receive feedback – poll of responses presented as histogram display
9. Lecturer summarises and explains 'correct' response

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Miyake and "constructive interaction"

We can understand Hake's and Mazur's demonstrated practical educational successes in terms of the theory developed in developmental psychology of how peer interaction promotes individual's conceptual advances.

Miyake (1986) got researchers round her lab to discuss their understanding of sewing machines.

Detailed analysis of the conversations showed that this was NOT teaching, yet both did advance their conceptions.

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Christine Howe's work (1)

Long series of studies on peer interaction causing conceptual development.

Good selected paper:
Howe, C.J., Tolmie, A, and Rogers,C. (1992)

To get the effect, you need to work on the setup:

Peers with different prior beliefs
Elicit commitment to their personal view in advance e.g. write their view, then show peers this opinion.

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Christine Howe's work (2)

- Benefit is delayed (e.g. 4 weeks)
- Final conceptions are different in solo than group interviews
- More advanced child ALSO advances still further
  I.e. it is NOT information transmission
- "not agreement but private conflict resolution"

⇒ Mechanism is metacognition
  (Howe, McWilliam, Cross 2005)

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Getting students to design the questions

This is another powerful teaching tactic ("learner authored questions"). Perhaps more suitable for levels 3,4?

Basic idea:
Students have to design a test MCQ   (best in a small group) complete with reasons why each response option is right or wrong.

Have to aim for questions that discriminate (splits class).

Why is this effective? Same underlying reason as Mazur: the factual question requires them to generate reasons …. 48

Summary on "catalytic" effects

These are all demonstrations of how learning-productive it can be to get learners to notice they have a problem, but not give them the answer.

This is the essence of Constructivism.

But many of these also use the social stimulus of peer interaction. These are one kind of Social Constructivism.

But note that these are NOT mainly about one peer having the answer and telling the other; not about the social distribution of knowledge; not about co-construction of either a physical or a mental product.

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neo-Vygotskian-ism

Links:
Wood's use of "scaffolding"
Wood's contingent tutoring

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Why is Vygotsky interesting for HE learning?

No proven reason at all to apply it here.   But ...

Paul Black's argument.

Three possible big claims (in extending it):
- How teaching and learning may work
- All (important conceptual) knowledge is pre-figured in a new, specific conversational type or style.
- All (important conceptual) knowledge IS a new, specific conversational type or style.

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What are the alternative learning strategies?

- Part-whole learning
- All-at-once [Vygotsky's implicit choice]

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What are the alternative Tutoring strategies?

Given a choice of All-at-once learning strategy, then:
What are the alternative Tutoring strategies?

- Contingent tutoring [c-tut] [Vygotsky's implicit choice]
- Modelling (i.e. demonstrating it by Teacher doing it)
- Explaining

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Scaffolding

Scaffolding is a metaphor for contingent tutoring.

Note that it simultaneously scaffolds:
- The social interaction and relationship
- The task as a whole (connecting the separate actions)
- The learner's understanding of the purpose and value of the task.

Can call these meta-knowledge, or ....

The c-tut tactic is not in fact just to provide a fixed scaffold: it is better thought of as "progressive withdrawal of scaffolding".

ZOPD/ZPD: the zone of proximal development. Dynamic assessment.

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What are some alternative Tutoring tactics?

Given a choice of All-at-once learning strategy, and
    Given a choice of the Contingent Tutoring tutoring strategy, then:
        What are the alternative Tutoring tactics?

- Pre-supposition and inference (in normal conversation)
- Hints
- Prolepsis: forcing inference of the conclusion, even when it would be normal to state it explicitly.

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Feedback

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Asking for feed back: elective feedback

With RPC or equally with tutor-marked assignments, another element is to ask the critiquer (marker) three things you would like comments on.

Sue Bloxham (Carlisle) has developed this so that students will <u>only</u> get feedback in response to such questions.

- Saves tutor time
- Gets learner thinking actively about feedback, so they are more likely to use it if given
- But crucially: can be the only way the learner will get feedback on the issue if in fact they are doing adequately so that the tutor would normally not pick it out for comment.

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Learner uses for feedback

Draper (2009b):

6 Ways a single learner may interpret a single feedback message.

6 goals a learner may have, and may self-regulate for.
- Self-regulating effort (2-dim feedback would assist this)
- Learning: improving future process and products (fprompt supports this)

- Revising the current product (doing corrections)
- Deciding what subjects (courses) to take in future / next.
- Deciding the quality / validity of the marker
- Deciding the quality / validity of the marking process (is it just random?)

RPC = reciprocal Peer Critiquing

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My current recipe for RPC

Reciprocal Peer Critiquing (RPC)
Psychology level 3 undergraduates.

Done twice, first with past (already marked) work;
    second for new coursework before submission.

- Students bring in and exchange work
- Prefaced by 1-3 questions they particularly want comments on
- Each critiques 2 others, address criteria plus the questions; rubric: best and worst feature
- Round table, F2F feedback, tutor chairing

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My current recipe (2)

Always goes down well with my students, once they've done it.

See Morrow (2006) for evidence.

Most enthusiastic about seeing how other students write, but also about getting feedback.

Perhaps best indicator is that having done it the first time, they commit to finishing the next bit of work a week early to allow time to do it then.

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Prompt sheet

Criterion 1: quality of literature research
  What's good?
  What could be improved?

Criterion 2: quality of the write-up
     i.e. well presented and clearly structured?
  What's good?
  What could be improved?

Criterion 3: quality of Critical analysis
  What's good?
  What could be improved?

Prompt sheet 2

This rubric was for an English course:

What is the issue that the draft is addressing? Is it interesting, or do you care?

Say what you think is the argument of the draft. If the argument is not clear, suggest what a possible argument might be.

What reasons does the writer offer to support the argument? (You may like to break down the argument into quasi-syllogistic premises or to identify a Toulmin-style warrant for the argument).

Suggest a counterargument to the argument of the draft. This comment may, alternatively, point out unexamined assumptions and/or missing or unacknowledged evidence.

Identify a characteristic sentence of the writer. Say what you think is good about this sentence, or how this sentence can be improved (your chosen sentence may simply identify a repeated writing fault)

Reciprocal peer critiquing: boxes ticked

Boxes ticked = principles enacted:
- Peer assessment (the peer voice)
- Exercise the criteria from another viewpoint
- Peers see each others' work (resource for remedies)
- See how own and others' work compares in quality
- Learners proactive in formulating feedback questions
- Can act on feedback directly (in 2nd application)
- F2F delivery means dialogue around feedback, and not just clarification but multi-party discussion.
- Multiple opinions on same work: information on variability
- Teacher scaffolds first RPC, then leaves it to the learners

Big scale RPC

What about big classes?
  As described, it works for groups of 2-6.

1. I've done it in a lecture group of 90 for short (100-200 word) passages: swap with neighbour and do RCP

2. Use software to manage it.
  There is free software, and numerous papers reporting experience, on how to do it with big classes (60, 600, ..)
  Quintin Cutts has some local experience;
  John Hamer: google "Aropa peer"

3. Speed RPC-ing?

Anonymous vs. F2F feedback

Pro-anonymous: data protection, privacy

Pro-face to face:
- More useful and serious critiques are elicited
- Dialogue for clarification of what the feedback means
- Dialogue of a more open-ended and multi-party kind
- Get feedback on the feedback you gave
- Hear critical issues directed to others but relevant to self. I.e. discussion of other work than only your own.

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The Vygotskian idea

Social constructivists, following Vygotsky, believe that for every form of thought there is a prefiguring type of conversation. That is where learners first grasp and start to join in this new type of dialogue; and later internalise it and so come to do it solo.

I make my students first exchange RPC comments round a table, face to face, with me there. This establishes the tone required: neither hostile, nor vapidly polite.
Then they can (and often do) do RPC without me there.
(This works without the irresponsibly glib, hostile, vacuous reviews often got with anonymous software-mediated RPC.)

The Vygotskian idea (2)

Possibly, it would be good to introduce students to this by a still more graduated sequence. For example:

1. Tutor "models" the kind of comment appropriate
2. Small groups compose joint critiques
3. Solo students deliver critiques F2F
4. Solo students deliver this by email etc.
5. Informal (self-organised) student use

Evidence from a puzzle about RPC
(Reciprocal Peer Critiquing)

Morrow (2006) found strong student attitude support for RPC's benefits, but strongest for being able to see others' work.

I.e. they seem to say that getting feedback on their work is not as useful as simply seeing alternative possible ways of doing it.

That's also what I find repeatedly in oral feedback.
Price et al (2007) found the same.
This doesn't exactly match published theories of feedback.

Students believe it's useful after having experienced the process; and then act on their belief by doing it voluntarily.
But it's not clear how to measure learning gains.

Not least because the gains may only be far in the future and certainly NOT on the current piece of work.

What underlies students' relationship with feedback?

What is wrong with students' relationship to feedback?

The questions:

Why don't students use feedback?
What is the real goal of feedback?
What goals do students really have which feedback could assist?
What is the real issue behind students' use of feedback?

The symptoms:

They don't pick up written feedback
They say they don't get feedback
They say it's not applicable to any future work they'll do
They look at the mark not the comments
They won't do any formative work unless there's a mark/credit

Possible analysis

A. For many students, it is as if they have absolutely no concept that feedback is part of their learning.
     Either they have never had any feedback that helped them, or they didn't notice it was helping them; and no-one actually talks to them about its role in learning and in university courses.

B. When their work is ready to return, it has wholly gone from their minds.
• Consequently if they read the comments, it won't be helpful since the context has gone and anyway they aren't thinking about it: it is unrelated to their current work and deadlines.
• Looking at the mark is done to decide whether there is any emergency which requires action: if not, then no further attention need be paid to the comments.

How should we change our approach to feedback?

The measure of feedback value

Feedback is of no use whatever unless it is used by students.
The criterion of teaching success here is: what specific thing they modify or reappraise as a result.

How fast the feedback is returned has no value in itself.
All the advice about the content and style of feedback has no value in itself.

We have to focus on what the student is going to do with it.
(See also Draper, 2009b: "What are learners actually regulating when given feedback?")

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New mottos:
What would it be like to embrace these?

There is no point in giving feedback unless the learner uses it: modifies or actively reappraises something specific as a result.

What would our teaching be like if it only counted as feedback when the learner used it to determine their behaviour as a result?

(How would we check on this? How would we tutors self-regulate our behaviour?)

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What kinds of student actions should we expect and support with feedback?

Regulating effort.

Look at the mark: decide if I need to work more, or less, on this course.

Correcting content.

Have I "got" this topic? Which bits don't I know or understand properly?

Improving procedural skill.

Which aspects don't I perform adequately, or understand properly

What facet of my essays / lab skills don't I do well enough?

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Making marks more usable and used

A case from a calculation based discipline.

Learners' goal:
Self-regulating their effort

Making <u>marks</u> useful to students

For a different kind of feedback — marks from a quiz — a different kind of prompting seems effective. That is, a mark or grade by itself can change a student's actions: i.e. can function as formative feedback.

For comprehension, increasing amounts of evidence suggests that explanations are not what students mainly need: once motivated, they'll find them themselves. Instead, they need to know what it is they don't yet understand. I.e. not comments, but "marks". [Mastery learning; Mazur's "PI"; Smith et al.2009)]

However what makes a mark into a signal which the student believes tells them that more work understanding this topic is needed?

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The problem

Learners look at marks; usually ignore feedback comments.

Marks may be summative assessment i.e. primarily supposed to be meaningful to third parties, but nevertheless students try to use them.

My university publishes marking scales, but they don't give the student any usable comparisons for the mark they receive.

Like giving a volume in minims, a weight in scruples, or a temperature in degrees Réaumur: numbers actually are only useful to people who already remember the numbers of some cases measured on the same scale as comparison points.

All measurement is relative i.e. comparative to something else. What should a student compare their mark to?

Two answers

Normative help: how does your mark compare to the rest of the class?
We can't now publish the list of marks; but could show the distribution; or perhaps a normalised ranking: e.g. which of the 10 bins of ranks are you in e.g. between the top 20-30% of the class.

Ipsative help:
How does this mark (or rank) compare to your previous marks?
How do these comments compare to your previous comments?

ICT could be a big help here in bringing up earlier marks and comments to this student even when a different marker is now reading their work.   80

Does this actually help learners?

Well, the commonsense argument seems quite good to me.

And I was struck a few years ago when a colleague mentioned using Ipsative comments routinely (I learn from mentions of good practice by colleagues, as well as from mentions of my bad practice from students).

And so it became a hypothesis for me that might explain a striking success locally:

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Eric Yao's success

Eric teaches a first year course at Glasgow: physics for engineers.
 N ≈ 40.   For the 4 sessions 2007-11 the pass rate went:
   40%, 67%, 38%, 95%.   More than doubled it, then.

BIG success. But we don't know why. Some hypotheses:

1. "Teacher monitoring": active monitoring of and commenting on each student's work. Each student feels their work is noticed.
2. "Self-regulation". Aspects of the course support this better.
3. "2-dimensional feedback"

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What Eric did

These 3 were implemented by one of the things Eric did. He made the class complete some online MCQs every fortnight; and then as head of class, emailed each student individually using the marks from the question bank. He thus made a personal communication (1), commented both on how this mark compared to that student's previous marks (ipsative), and to the rest of the class on this piece of work (normative) (3), and thereby promoted their time on task i.e. their self-regulation (2) of effort by giving them this feedback on the effect of their effort on their marks.

A student I interviewed from this course made this vivid for me.
He ended up with an A, but didn't sound like a typical A student. He said he didn't like the 9am lectures and if he missed one he felt he'd caught up by reading the slides etc. on line; but he noticed that the quiz marks he got didn't support this feeling and so he made more effort to keep up attendance.   83

Prompted student processing of marks

2-dim feedback by itself (e.g. from a computer) might not do it.

Eric additionally wrote personal emails thus achieving what I have called "teacher monitoring".

You could explain it in social terms; or you could explain it in cognitive terms directly parallel to the "Prompted student processing of feedback" described in my first talk. His emails provide a prompt for students to notice and reflect for a moment on their marks (rather than on qualitative feedback). Without that, they may not pay any attention and so the whole exercise of doing the quiz and getting a mark would be without effect on the learners.   84

Comments on 2-D feedback

Different students are not all interested in the same scale / comparison. A star student often likes the normative comparison; a middling student likes to see if they have improved instead of focussing on how they are still way behind the star.

These are not the only 2 comparisons, and may perhaps not be the best 2 either.

What my students would most like in addition is underlined predictive feedback: a prediction of how this current mark predicts (at least based on historical data) their eventual degree class.

Furthermore what we should really do is not return a single portmanteau mark, but a vector of marks: one for each stated marking criterion (as Rowntree argued in 1977). This would still be marks without comments, but would greatly extend the useful information content.   85

Summary: 3-D feedback

Marks, like any measure, are not meaningful unless the reader has benchmarks in their head to compare them to.

The 3 scales which are probably the most wanted are:

- Ipsative: compared to the student's own previous marks

- Normative: compared to the rest of the class on the same task

- Criterion-based: what degree class does this mark predict?

Prompting the processing of feedback: Making feedback comments used

A case from an essay based discipline.

Learners' goal: regulating their grasp of skills and content

Some things I've tried in my own feedback practice
(I have a year 3 (of 4) tutorial group of 5-6 students each semester.)

I organise reciprocal peer critiquing (RPC), which they value, and which also sets up a good peer atmosphere for discussion.

But my own feedback seemed less successful, even though I:
- Provide the feedback in typed form (they say this is important)
- Provide both positive and negative comments
- Suggest specific changes that could have been made.
- Promote elective feedback
      (the learner says what issues they particularly want feedback on)
- Give them all the feedback for each of them (peer sharing).
- Require them to pick up the feedback from me, and read it on the spot.
- Promote discussion of feedback with myself.
- Promote discussion of feedback with peers.   88

Nevertheless ... failure

Yet disappointingly, not a lot of discussion happened.

I had failed to get good discussion about returned feedback to happen, and wanted it to.

Learners (my tutees anyway) seemed just not to be thinking about the feedback, even though they turned up to meetings and read the feedback. Their memory of their original work had faded from both their memory and their to-do list, and reading even extensive feedback was not enough to make them think about it actively.

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Then success: Prompted student processing of feedback

As before, then after they have read the feedback, sitting round in a group in my office, I asked them each to fill a prompt sheet:

1. You were keen to know what mark I had given you.
      a. Why is that important to you?
      b. What will you do differently because of the mark? (or what would you have done differently if the mark had been a lot different?)
2. If you had to re-edit this essay, then how would you apply my feedback to do this, if at all?
3. How will you apply my feedback to writing your next essay?
4. How will you apply my feedback to critiquing other students' essays in future?
5. Re-phrase (each of) my comments on your essay in your own words: what do they mean, what did they apply to what future actions do they imply?
6. Is the feedback I wrote at all useful to you personally, as far as you can tell now?   90

Evidence from 2 trials

Almost all said they valued the oral discussion around the feedback process as greatly as the personal written feedback.
One commented that it made her actually process the feedback, implying that normally she wouldn't have done so.

Before I started using the prompt sheets, even very good students would say after receiving my feedback things like: that's interesting but I don't think it will be relevant to my next assignment which will be marked by someone else.
Now, they don't say that, and have little trouble filling in on the sheet things they will do differently in the light of the feedback.

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So:

The job of providing written feedback isn't done with the writing: we have to do something to get learners to process it.

They showed no sign of resenting the time to do this; and one student, who couldn't make the group time, filled it in at home before coming in to see me.

_____

Thus to summarise, there are 2 jobs to do in making feedback actually useful:
• Making **comments** useful to (acted on by) students
• Making **marks** useful to (acted on by) students

Both involved an aspect of prompting reflection by students. 92

A place to stop

For the slides, handout etc. see:

http://www.psy.gla.ac.uk/~steve/courses/cere.html

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