CERE slideset 5:
Concepts and Empirical Results in Education

Expectation effects
Motivation
Course overview / practice / exams
etc.

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Summary wrap-up on Dialogue and Feedback

Laurillard model principle B of feedback and convergence

?Recap
Chi active/ framework
Chi's meaning vs. others for the terms
My application of this frame to fbck /
to student revision methods
Discussion?

Principle B underlying Laurillard

Last session I focussed on this general principle, which in her model (and in Vygotsky) is usually presented as dialogue between 2 individuals: teacher and learner. In this section I will first summarise how it applies to conventional written feedback to individual students. But then I'll briefly discuss wider situations.

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 in addition.

Wider scopes (1)

2) Jigsaw, in requiring learning from peers, organises dialogue (feedback and convergence) between peers.

3) One feature of teacher feedback in small classes and at school, is that the teacher gets to know each learner, and writes feedback partly from their memory of their previous piece of work ("ipsative feedback"). This is more personal, and probably more useful. In effect, the dialogue has a significant feature of extending over a whole year or more, not just for a one-off piece of marking. (Anonymous marking prevents this of course.)

4) Patchwork text is a design where peer feedback cumulates over a year, with benefits as student "reviewers" get to know the personal concerns of their group members.

Wider scopes (2)

5) JITT (Just In Time Teaching), now often called "flipped classroom" is where even in huge classes, homework is set in advance, usually the students then have to respond e.g. do an online quiz; and the F2F class is wholly or partly created as a response to the students' responses. This is taking principle B to a deeper level: with whole "lectures" being <u>contingent</u> on student responses. This is implementing Laurillard activities 2,3, ...; and also showing a dialogue and contingency that is <u>not 1:1 but 1:many</u>.

2cc: The two channel classroom

6) One year in this class, I introduced 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, or not, their active experience of the lecture in a way likely to promote learning, but not interrupt channel 1.
- This combines peer and teacher interaction: broadening the scope of principle B.

Questions?

1. What don't you understand yet?
2. What is the single most important message / issue here under "Perry"?

- Shout out
- Vote
- Correct

Social aspects in learning

Social aspects of knowledge (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.

Social aspects of knowledge (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.

Three independent social aspects of learning

One aspect of the social in learning, is about the foundation of the knowledge being learned (see previous two slides, introduced last session).

Another aspect is whether the learner in some sense constructs knowledge alone (Piaget); with a teacher (Vygotsky); or in interaction with peers. This is about whether and in what way the process of learning is social.

A third aspect (next slide) is about 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)

Motivation, goals

Link back to:
Vyg, Mgt layer aspect of interaction

Expectations
Mgt layer; Vyg on mgt
Draper09b : L goals
Snyder

VGames, GradAs

Learner motivation

Learner motivation

I began the course by saying that you might define HE as where learning depends almost entirely on learner motivation (students learn almost nothing unless they intend to); while infants (perhaps up to about 7 years old?) learn ferociously but without experiencing it as a choice.
So learner motivation could be the single biggest factor in determining achievement.
(Motivation + good goal + effective method + exec. ability)

If you want to look at the psych. literature on motivation, the introduction section of Lieberman & Remedios (2007) is a starting point. [Pintrich is a leading researcher]

Their paper as a whole is about an interesting phenomenon:
the collapse of intrinsic or a rise in extrinsic motivation in HE students.   Satiety?

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Intrinsic / extrinsic

The traditional distinction is between intrinsic and extrinsic motivation.

Intrinsic
E.g.: love of psychology, pleasure in attending your evening class

Extrinsic
E.g. Need the certificate for my next job; have to learn about autism to care for my own child.

Most people probably have a mixture, not one or the other
(Stephen King; J.K.Rowling; Larry Niven).
(1) In fact it may be better to think of them as 2 independent dimensions; not as either/or.
   A rise in one may *look* like a fall in the other, but not be.
(2) Breathing.

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Video games are founded on an intrinsic love of learning

Turnover (it's big business)
Not just the young.   Not just males.
Voluntary creation of informative websites ....

=> At bottom, the motivation seems to be an intrinsic love of learning stuff which is of no possible extrinsic use in the real world.

so why does formal education do so poorly?   19

My analysis of VideoGames

As covered in session 1, Video Games are huge business (bigger than Hollywood) in terms of consumer money *and* time spent.

Their appeal has an overall driving motive of intrinsic love of discovering (learning) the rules for their own sake.

The chief learning method is play (trying things out);
but may involve other learning methods at times.

There may be additional rewards sometimes, both intrinsic and extrinsic e.g. playing for money, or fame (the latter is a social satisfaction); the visual pleasures so many games spend lavishly on creating.

Matt Barr: Learning graduate attributes from video games

In video games, and also in education, some learning is "incidental" or "vicarious": unintended by the learner.

Barr argues that play of some commercial (i.e. for entertainment) Vgames results in markedly improved graduate attributes.

What are gradAs? what is *this* gradA? – Communicative Adaptability.

Communicative Adaptability Scale

1. I feel nervous in social situations.
2. In most social situations I feel tense and constrained.
3. When talking, my posture seems awkward and tense.
4. My voice sounds nervous when I talk with others.
5. I am relaxed when talking with others.
6. I try to make the other person feel good.
7. I try to make the other personal feel important.
8. I try to be warm when communicating with another.
9. While I'm talking I think about how the other person feels.
10. I am verbally and nonverbally supportive of other people.
.....
30. People think I am witty.

Matt Barr results

Pre/post tests of participants' scores on the communicative adaptability scale showed an increase with effect size 0.6 (Medium effect size)

The intervention was play of eight Vgames over about 8 weeks in total, about 2 hours per week; not all connected with communicative skill.

Relevance of this here:

• Example of unintended learning

• Of learning a largely tacit skill, not explict

• Of learning procedural (a skill), not "declarative" (factual)

  knowledge.

Motivation (cont.)

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Can goals be taught? yes.
Can intrinsic motivation be taught? yes.

Clearly one job of Teachers might be to tell students what they must do, must learn. Yes, goals are routinely taught.

But sometimes a love of a subject is taught: intrinsic motivation being transmitted.

"Enthusiasm" is regularly one feature student evaluations show is valued by students: should we see that as teaching intrinsic motivation?

[Yao's Hebrew class.   Henry Moore's student]

Also: consider:
• Values (a way of choosing goals; creating them from new contexts)
• Goals (concrete things to achieve)
• Plans (methods for learning)

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Constructivism and learning goals

But in fact, learner and teacher goals may be much more similar than either realise. The clever teacher gets students to "create" their goals, so they "own" them: with motivation benefits.

Hebb (1955): no teaching until the school children asked for it.
Gordon Doughty: start a lecture by getting students to say why it is worth teaching and learning that lecture.

Consider your maxi projects / CRs: large amounts of self-choice?

Positive view: L&Ts agree the goals, which are then jointly held and owned.
Cynical view: Ts manoeuvre Ls into re-inventing what T wants.

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Students' real goals

But most of the discussion of learner motivation is only about motivation to learn content.

What are learners' actual goals when in the middle of a course?

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Snyder: "The hidden curriculum"

Different students want and get different things from the same course.
(Just as different readers see and get different things from the same book, if it's good.)

One sense of a curriculum being hidden, is that it is hidden from the teachers.

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Which goal are students pursuing, and regulating?

1. Learning stuff (content knowledge): will show in future process and products (Do I know this stuff yet?)
2. Effort (Put more or less time and effort into this goal?)
3. Doing stuff, a current assignment: (doing corrections on this product)
4. Choosing future courses (/ careers).

(See Draper 2009b)

=> much of the time it is NOT content knowledge which students are improving in the light of feedback.

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Learner autonomy; and proactive-ness

Allen Tough: adult learners create and pursue their own learning goals. A huge hidden phenomenon. They also mostly organise it without paid teachers.

A slightly different question: are learners (on a given course) **proactive**? See the 4th dimension in my table of all the ways learners benefit from others.
Generally, for most activities, we can see cases where the teacher initiates (and organises) it; other cases where the learner does.

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Connections to points already made about motivation

- The LTP "management layer": how it is negotiated between learner and teacher
- Snyder and "the hidden curriculum": different students want and get different things from the same course (as readers do with a book).
- The different goals a student pursues (Draper 2009b): choosing courses, managing effort, ...
- Allen Tough
- Learner pro-activeness (as in the big table last time)
- Contingent tutoring; Vygotsky.

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Contingent tutoring and the management layer

Contingent tutoring not only scaffolds the knowledge / skill being learned, it ALSO scaffolds the management of the activity.

The tutor is the only one at first who understands how the actions piece together, and perhaps what the goal is. As the learners progress they manage larger and larger chunks of action themselves, and increasingly understand <u>why</u> they are doing each action.

C-tut is operating simultaneously at the knowledge and management layers.

Often the learners are learning the goal and its meaning as well as how to achieve it; and certainly each subgoal.

As a child you play doctor and wear a white coat; in medical school you learn what it is to "be" a doctor.

C-tut embodies the Vygotskian idea of how goals are "taught".

Motivation type 2

Vygotsky draws our attention to how willing we are to go along with other people, with a group or a leader, without understanding what we are doing or why.

(Milgram, the holocaust, joining in a song, ...)

It's not too strong to say that we have one motivation system determining what we initiate and complete by ourselves; and a second different one that determines what we will go along with. Without the second, we probably could not learn much at all.

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Using parallel aspects / tick boxes to analyse learning designs

Aspects:

Cognitive, motivational, social

See them as parallel aspects.

Svinicki

In a simple paper Svinicki (1991) suggests that there are 3 independent psych / educational theories which independently can be used to improve teaching:
- Cognitive
- Social
- Motivational

This implies that:
A) Sticking with test scores that measure learning outcomes (a cognitive view) is not capturing all that is essential in education
B) Any learning design will have effects of all three kinds. Genius designs will address all three.

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Examples

My RPC (reciprocal peer critiquing): a successful exercise both

causes learning and bonds the team/group; which then makes

later L-activities go much better with much higher student

autonomy and reciprocal support.

Jigsaw (Aronson) both bonds a class even in unpromising

circumstances (Texas and school desegregation); and

supports learning. These are quite different effects. [Sherif]

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Perspectives

The idea here is that each perspective can be analysed
independently of the others.
(Even though in reality, any learning design or activity usually has
effects in all 3 domains.)

(This is common in engineering: electronics, coffee mugs, ...)

Many experiments only take one perspective; but a real practising
teacher should address all of them.

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Aspects

As above: Cognitive, Social, Motivational

RDW: are they all covered?

Laurillard's 12 activities
Perry.
Deep and Surface.

Bloom's taxonomy

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Knowledge-types

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Proc and decl

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Procedural vs. declarative knowledge

"Declarative" knowledge includes facts, concepts.
"Procedural" knowledge is knowing how to do something.

Learners may need testing on declarative knowledge but in fact
they can test themselves; and more importantly, they can self-
correct once they have noticed they got a fact or concept
wrong. Human feedback is seldom essential, though getting
them to **use** material in order to provide occasions for noticing
their own gaps is important.
(Catalytic assessment; confidence testing; ….)

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Procedural knowledge

A fact is a single item: if it's wrong, there's no puzzle where the problem is.

Any procedure, however, is a long sequence of actions. If it's wrong (produces the wrong answer or effect) it is generally not clear which step of it was wrong. Diagnostic feedback is very important, though advanced learners eventually acquire sophisticated meta-procedures for self-diagnosis of failed procedures.

If you give me an essay and I just say there's something wrong with it, that is of little help. If you bake a cake, and when it comes out of the oven it is obviously bad, again you are often at a loss. Similarly if your computer program just fails, you don't know which line and which character is responsible.

Generally speaking, procedures have many more component parts; and learners are much more in need of both practice and helpful feedback in learning them.

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Feedback on procedural learning

The literature also supports this, that feedback has more positive effect on learning for procedures than for declarative material.

Hattie & Timperley (2007) "The power of feedback" can be interpreted as arguing that feedback on procedural learning is more important, because (only) it leads to transfer.

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So: procedural vs. declarative learning

Chick sexing is a procedural skill.
The Biederman dramatic improvement in effect converted a tacit procedural skill into a declarative one.
Quite likely, this type of manoeuvre would work in general.

Teacher training is a case for reflexive application of this;
I.e. the evidence seems consistent with the idea that teacher skill makes a big difference to learning outcomes BUT is largely tacit I.e. encoded as a procedural skill but not much accessible to conscious reasoning.

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"Stepwise" disciplines
Essay vs. calculation based disciplines

xxx

"Creativity"

Creativity

To count as creative, the product must have all these properties:
• Human agency (as its cause)
• Utility (i.e. of value to people)
• Novelty (as a matter of history)
• Surprise (contrary to expectations)

It consists of a new configuration of old elements.
It consists of combining a use and a means for achieving it.
You may have a use and search for a new means; [better coffee mug]
or have a means and search for a new use. [post-it notes]

Ken Robinson argues that the economy now and in the future depends on having creative people; and that our education system kills off this attribute.

BUT modern internet software e.g. Facebook consults users not a genius' creativity.

About the course

About the course 1

- **Survey of the course as a whole**

- **Exam advice**

topics (incomplete list)

Feedback

Chi 2008: paper on watching videos of tutorials

Draper 09b: Different goals learners work to achieve; different interpretations of a piece of feedback

Constructivism / Social Constructivism

Big effects in education

The three roles of a teacher

The importance, or lack of it, of a teacher

Contingent tutoring

Laurillard model

Deep and surface learning

Perry's model

Reflection

Interaction

All the ways in which others may assist a learner (table; 4 binary dimensions)

Learning as Participation (not Acquisition)

Learner motivation (perhaps including expectancies;   perhaps including pro-activeness)

Expectation effects

Read, discuss, write: the fundamental triad for studying?

Questions for each issue

I'm going to pick some of the issues randomly. For each picked:

1. What other topics is it strongly linked to, and why?

2. How to apply it to this course?

3. How to apply it to the maxi project?

4. How to apply it to the L3 statistics course?

Exam /revision advice

There are past/ sample exam questions, some with outline answers on my course web page.

The style of question generally asks you to link some topics

A general criterion for marking is whether the answer displays critical thinking.

In this course particularly, linking the ideas to your personal experience (of education) is appropriate and shows you have understood the ideas (not just learned their names) by giving an example that was not given in the lectures.

A place to stop

For the slides, handout etc. see:

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