Feedback and Grading: Connecting the Dots

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Kinds of feedback: Israel

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- 264 low and high ability grade 6 students in 12 classes in 4 schools; analysis of 132 students at top and bottom of each class
- Same teaching, same aims, same teachers, same classwork
- Three kinds of feedback: scores, comments, scores+comments

	Achievement	Attitude
Scores	no gain	High scorers : positive Low scorers: negative
Comments	30% gain	High scorers : positive Low scorers : positive

Butler (1988)

Responses

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	Achievement	Attitude
Scores	no gain	High scorers : positive Low scorers: negative
Comments	30% gain	High scorers : positive Low scorers : positive

What happened for students given both scores and comments?

A. Gain: 30%; Attitude: all positive
B. Gain: 30%; Attitude: high scorers positive, low scorers negative
C. Gain: 0%; Attitude: all positive
D. Gain: 0%; Attitude: high scorers positive, low scorers negative
E. Something else

Kinds of feedback: Israel (2)

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- 200 grade 5 and 6 Israeli students
- Divergent thinking tasks
- 4 matched groups
  - experimental group 1 (EG1); comments
  - experimental group 2 (EG2); grades
  - experimental group 3 (EG3); praise
  - control group (CG); no feedback
- Achievement
  - EG1>(EG2≈EG3≈CG)
- Ego-involvement
  - (EG2≈EG3)>(EG1≈CG)

Butler (1987)

Effects of feedback

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- Kluger & DeNisi (1996) review of 3000 research reports
- Excluding those:
  - without adequate controls
  - with poor design
  - with fewer than 10 participants
  - where performance was not measured
  - without details of effect sizes
- left 131 reports, 607 effect sizes, involving 12652 individuals
- On average, feedback increases achievement
  - Effect sizes highly variable
  - 38% (50 out of 131) of effect sizes were negative

Getting feedback right is hard

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Response type	Feedback indicates performance…	
	falls short of goal	exceeds goal
Change behavior	**Increase effort**	Exert less effort
Change goal	Reduce aspiration	**Increase aspiration**
Abandon goal	Decide goal is too hard	Decide goal is too easy
Reject feedback	Feedback is ignored	Feedback is ignored

Unfortunately, humans are not machines…

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- Attribution (Dweck, 2000)
  - Personalization (internal v external)
  - Permanence (stable v unstable)
  - Essential that students attribute both failures and success to internal, unstable causes (it's down to you, and you can do something about it)
- Views of 'ability'
  - fixed (IQ)
  - incremental (untapped potential)
  - Essential that teachers inculcate in their students a view that 'ability' is incremental rather than fixed (by working, you're getting smarter)

"Flow"

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- A dancer describes how it feels when a performance is going well: "Your concentration is very complete. Your mind isn't wandering, you are not thinking of something else; you are totally involved in what you are doing. … Your energy is flowing very smoothly. You feel relaxed, comfortable and energetic."
- A rock climber describes how it feels when he is scaling a mountain: "You are so involved in what you are doing [that] you aren't thinking of yourself as separate from the immediate activity. … You don't see yourself as separate from what you are doing."
- A chess player tells of playing in a tournament: "… the concentration is like breathing—you never think of it. The roof could fall in and, if it missed you, you would be unaware of it." (Csikszentmihalyi, 1990, pp. 53–54)

Motivation: cause or effect?

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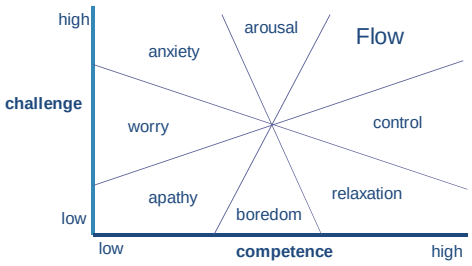

Csikszentmihalyi (1990)

Integrating different perspectives

Dual pathway model

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- "…students who are invited to participate in a learning activity use three sources of information to form a mental representation of the task-in-context and to appraise it:
  1. current perceptions of the task and the physical, social, and instructional context within which it is embedded;
  2. activated domain-specific knowledge and (meta)cognitive strategies related to the task; and
  3. motivational beliefs, including domain-specific capacity, interest and effort beliefs." (Boekaerts, 2006, p. 349)

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- As a result of the appraisal, the student activates energy and attention along one of two pathways
  - the *growth* pathway (increasing competence)
  - the *well- being* pathway (prevent harm, threat or loss)
- Integration of other theories
  - Mindset (Dweck, 2000)
  - Mastery and performance goals (Dweck, 2000)
  - Interest (Hidi & Harackiewicz, 2000)
  - Self-regulated learning (Deci & Ryan, 1994)

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"These considerations of utility and alternative interventions suggest that even an FI [feedback intervention] with demonstrated positive effects on performance should not be administered whenever possible. Rather, additional development of FIT [feedback intervention theory] is needed to establish the circumstance under which positive FI effects on performance are also lasting and efficient and when these effects are transient and have questionable utility. This research must focus on the processes induced by FIs and not on the general question of whether FIs improve performance—look at how little progress 90 years of attempts to answer the latter question have yielded." (Kluger & DeNisi, 1996 p. 278)

Providing feedback that moves learning on

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- Key idea: feedback should:
  - Cause thinking
  - Provide guidance on how to improve
- Comment-only grading
- Focused marking
- Explicit reference to rubrics/scoring guides
- Suggestions on how to improve:
  - Not giving complete solutions
- Re-timing assessment:
  - e.g., three-quarters-of-the-way-through-a-unit test

The elephant in the room: Grading

Identify milestones (and inch pebbles)

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- Development of speaking and listening in
  - Show confidence
  - Show awareness of listener needs
  - Speak clearly
  - Use a growing vocabulary
  - Listen carefully
  - Respond appropriately
  - Formal vocabulary
  - Sense of audience

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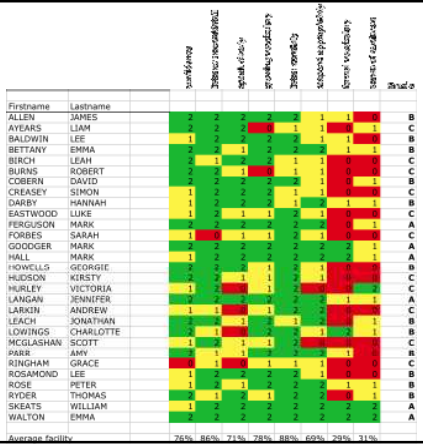

Firstname	Lastname									
ALLEN	JAMES	2	2	2	2	2	1	1	0	B
AYEARS	LIAM	2	2	2	0	1	1	0	1	C
BALDWIN	LEE	1	2	2	2	2	1	1	0	B
BETTANY	EMMA	2	2	1	2	2	2	1	1	B
BIRCH	LEAH	2	1	2	2	1	1	0	0	C
BURNS	ROBERT	2	2	1	0	1	1	0	0	C
COBERN	DAVID	2	2	2	2	2	1	0	1	B
CREASEY	SIMON	1	2	2	2	1	1	0	0	C
DARBY	HANNAH	1	2	1	2	1	2	1	1	B
EASTWOOD	LUKE	1	2	1	1	2	1	0	0	C
FERGUSON	MARK	2	2	2	2	2	2	0	1	A
FORBES	SARAH	1	0	1	1	2	1	0	0	C
GOODGER	MARK	2	2	2	2	2	2	2	1	A
HALL	MARK	1	2	2	2	2	2	2	1	A
HOWELLS	GEORGIE	2	2	2	1	2	1	0	0	B
HUDSON	KIRSTY	2	2	1	1	2	1	0	0	C
HURLEY	VICTORIA	1	2	0	1	2	0	1	2	C
LANGAN	JENNIFER	2	2	2	2	2	2	1	1	A
LARKIN	ANDREW	1	1	0	1	2	2	0	0	C
LEACH	JONATHAN	2	2	1	2	1	2	0	1	B
LOWINGS	CHARLOTTE	2	1	0	2	2	1	2	1	B
MCGLASHAN	SCOTT	1	2	1	1	2	0	0	0	C
PARR	AMY	2	1	1	2	2	2	1	1	B
RINGHAM	GRACE	0	1	0	1	1	1	0	0	C
ROSAMOND	LEE	1	2	2	2	2	1	0	0	B
ROSE	PETER	1	2	1	2	2	2	1	1	B
RYDER	THOMAS	2	1	2	1	2	2	0	1	B
SKEATS	WILLIAM	1	2	2	2	2	2	2	2	A
WALTON	EMMA	2	2	2	2	2	2	2	2	A
Average facility		76%	86%	71%	78%	88%	69%	29%	31%	

Connecting (some more of) the dots

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- Development of science skills in eighth grade
  - Use of laboratory equipment
  - Metric unit conversion
  - Density calculations
  - Density applications
  - Density as a characteristic property
  - Phases of matter
  - Gas laws
  - Communication (graphing)
  - Communication (lab reports)
  - Inquiry skills

Assessment matrix

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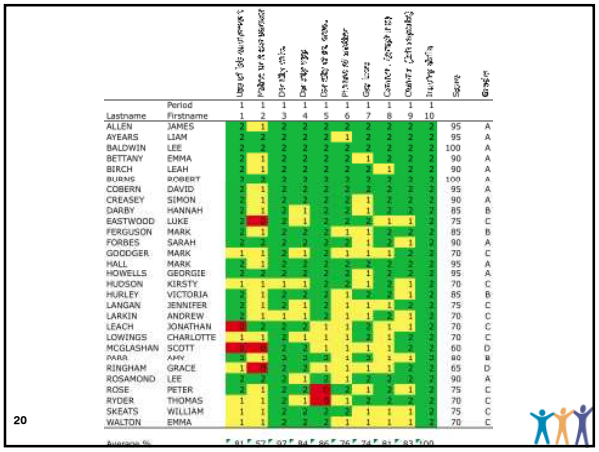
	Equipment	Metric units	Density calculations	Density properties	Phases of matter	Gas laws	Communication (graph)	Communication (report)
Homework 1		✓						
Homework 2			✓	✓				
Laboratory 1	✓			✓				✓
Homework 3					✓			
Module test		✓	✓	✓				
Laboratory 2	✓				✓	✓	✓	✓
Homework 4					✓			
Final exam	✓	✓	✓	✓	✓	✓	✓	



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Mapping out the terrain

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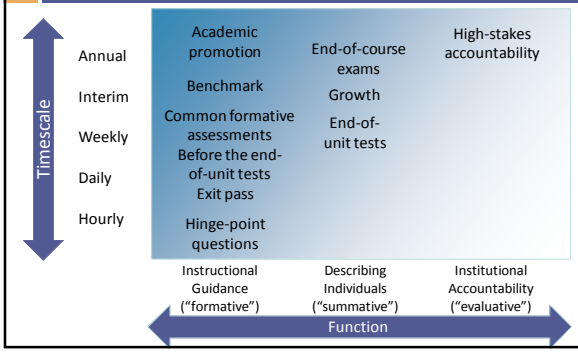

Thank You

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