Research into student mindsets: implications for student engagement and retention

Part 4:
Other studies and a social interpretation of mindsets

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For the slides, handout etc. see:
http://www.psy.gla.ac.uk/~steve/talks/dweck1.html

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[a] Similar large educational effects

Dweck's mindset theory is published as a psychological theory of the individual learner.

However from an educational perspective, there are a number of studies (including hers) that:
  •Demonstrate large effects on learners
  •Apply only a small, cheap intervention e.g. one sentence
  •Operate by addressing learners' confidence in their ability
  •(Each claims to work by a different psychological theory)

These studies establish important effects of benefit to learners, but do not test one theory against another.

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Mueller & Dweck 1998

10 year old US school children, Raven's matrices

1. Medium difficulty set or problems
2.   Marks plus praise for a) nothing or b) effort or c) ability
3. Harder task set
4.   Told they had done badly
5. Medium difficulty task set
6.   Results: a) ±0   b) +10% c) -10%

N.B. intervention 5 seconds (one sentence)
Effect on task performance rather than learning (strictly speaking)

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Dar-Nimrod et al 2006

      Canadian female undergraduates
1. Maths test
2. Reading comprehension test (with intervention material)
      a) material argued that no real gender differences in maths
      b) material argued there are real gender differences in maths
3. Maths test

Significantly better performance on 2nd maths test if (a):
      scored ≈ 20% better than (b)

Effect on task performance rather than learning (strictly speaking)

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Cohen et al 1999

US undergraduates, AA (African American) and EA
Write a letter of commendation for publication for a teacher they have known.

Week 2 they get feedback on their letters, extensive criticisms and remedial actions to take. Preceded by a) no rubric b) praise rubric c) magic rubric
Pre/post measures of motivation, and of self-rating at writing skills.

Motivation: if AA and (a), drop in motivation score
Only if (c), higher attitude on writing skills for both AA and EA

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Cohen et al 2006

US middle school children,
Early in the year, a 15 min. written assignment
Choose and write about your (a) most or (b) least important value

End of semester: if African American and (a) then +0.25 of a grade
This reduced failure rate (< D grade) from 20% to 9%

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Simpson et al 2008

Open University undergraduates just pre-entry
a) No phone call
b) A phone call with a script eliciting discussion of student's strengths at learning.

If (b) then -5% dropout in following year (first year)

[b] The detailed interventions

The published studies show important effects, but their explanations both differ wildly from each other, and yet may not really specify all the important elements in their interventions.

Looking at the wording of the "rubric" interventions suggests contributions to the successes from tacit teacher skills not fully described in the researchers' explicit theories.

Mueller & Dweck 1998

"Wow, you did very well on these problems. You got [number of problems] right. That's a really high score."

Either: "You must be smart at these problems."

Or "You must have worked hard at these problems."

Or nothing.

Quintin

"Remember, learning to program can take a surprising amount of time & effort – students may get there at different rates, but almost all students who put in the time & effort get there eventually. Making good use of the feedback on this sheet is an essential part of this process."

Cohen 1999

"It's obvious to me that you've taken your task seriously and I'm going to do likewise by giving you some straightforward, honest feedback. The letter itself is okay as far as it goes—you've followed the instructions, listed your teacher's merits, given evidence in support of them, and importantly, produced an articulate letter. On the other hand, judged by a higher standard, the one that really counts, that is, whether your letter will be publishable in our journal, I have serious reservations. The comments I provide in the following pages are quite critical but I hope helpful. Remember, I wouldn't go to the trouble of giving you this feedback if I didn't think, based on what I've read in your letter, that you are capable."

[c] Another view of interpreting failures

Another way of looking at this area is that (negative) feedback events in our lives are generally ambiguous. On this view:
- Each individual uses all the interpretations each day
- Individuals are not fixed in their interpretation
- But equally are rather open to being influenced by others / events.
- Mindsets correspond to just 1 of 6 interpretations

(This view leads to other interesting educational possibilities.)

Here the view is that the interventions aren't about changing a learner's view about one of these 6 issues, so much as switching between interpretations of what to attribute failure to.

The alternative interpretations of a failure

1. Technical knowledge or method: I didn't use the best information or method for the task
2. Effort insufficient
3. Method of learning about the task
4. Ability, trait, aptitude.
5. Random event
6. The judgment process was wrong, I was right.

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Corresponding self-regulatory actions

1. Work out the appropriate improvements to my knowledge and skill, and adopt them as permanent parts of my future practice.
2. Increase or decrease the time and effort allocated
3. Seek out new ideas on study methods.
   Find better information on the true task criteria
4. Change the course I'm taking.
5. Persist: try, try, try again
6. Get a second (and third and fourth) opinion.

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Elements in the successful interventions

- Learners' self-estimates of capability / mindsets / learning self-efficacy
- Effort,
- Perseverance,
- New specific techniques to apply
- Evidence
- Telling the learner how to interpret the feedback
- Telling the learner what specific actions to take

It is likely that you can improve self-belief without changing learners' actions and so effectiveness.

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(d) Mindset and self-efficacy: outline argument

However if we do focus on learner self-efficacy, then:

A. The main determinant of self-efficacy is experience of success
(at that particular task).
So what experiences and measures of success do we as teachers provide?

B. But we also necessarily pick up a lot from others' opinions.
(can you jump that ravine? Learn to read minds if you try hard?)

*Rosenthal's Pygmalion effect of teacher expectations
Bales' categories. Boekharts' observation.
*Student generated content. (Betty Collis, Aronson's Jigsaw classroom)

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Belenky and the "silenced" epistemological position

Belenky extended Perry's stages "downwards" to include a "silenced" position. Here, a person doesn't believe they are capable of knowing anything, much less of learning. They depend on being told what to do.

This seems like an extreme form of fixed mindset.
Like Dweck, this work sees a close connection between actual learning ability and beliefs about the nature of learning, of knowledge, and of one's identity (seeing yourself as a learner, or not …).

It is also interesting to think here about the work of Allen Tough on adults' learning projects: universal, yet not perceived by the learners themselves.
Papert: is (low) learning self-efficacy specific to institutional learning?   17
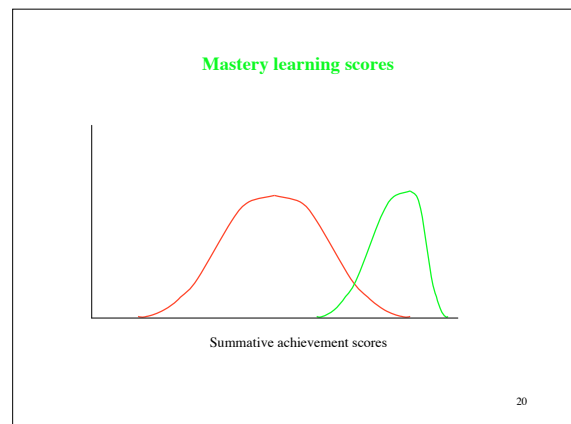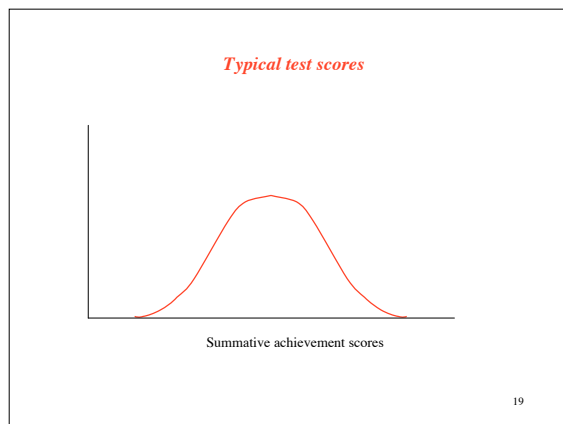
[e] Carroll and Mastery Learning

In 1963-1980 the work by J.B.Carroll and then Bloom showed the irrationality (and damaging nature) of the standard attitude that school tests measure ability.

If you assume the learning and teaching must be constant, then the spread of test scores looks like a measure of learner ability.

But (they showed) if you vary the time and/or teaching method, then the spread largely disappears: so the former spread can't be a measure of learner limitations.

ML set out to give every learner the experience, not of praise, but of objective success.

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Typical test scores

Summative achievement scores

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Mastery learning scores

Summative achievement scores

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Mastery Learning

Mastery Learning demonstrated the same effects as the recent published studies mentioned above, more widely, 25 years earlier, using similar methods.
- Telling the students not to interpret formative tests as ability measures
- Giving them highly specific suggestions about how to improve, and the occasions to act on this.
- Showing confidence in them, based on most of the class succeeding
- Giving them the experience of success on objective tests
- I.e. basing assertions on evidence not empty words

One difference was that the first and original aim was to to change the mindset teachers have about learners: to convince them that almost all learners can succeed, and that exams are NOT there to label student performance as a measure of capability.

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A social version of mindsets / self-efficacy

The recent studies have all taken an individualist approach, treating it as a property of individual learners, and intervening with individuals. Perhaps we should consider a social perspective on learning self-efficacy.

Bloom's mastery learning (ML) rests on the view that if the only tests a learner gets show differences between learners (but without comparing different teaching methods, learning actions, time taken, ….) then all society tends to interpret them as about learner abilities.   (Experimental design)

ML set out to give every learner the experience, not of praise, but of objective success (individual "mindset");
And to change teachers' minds: social "mindset".

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A social version of learning self-efficacy (2)

• Rosenthal's Pygmalion effect of teacher expectations
• Belenky's silenced position: you can bully someone into believing they can't know or learn.

• Adults and school children spend a lot of time telling whose opinion is worthwhile.
Bales' categories. Boekhaerts' observation.

• Student generated content. (Betty Collis, Aronson's Jigsaw classroom, Brown&Campione, PAL?)
Gives all learners the experience of being useful to others' learning.

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A place to stop

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