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Invisible Ties: Finding Learning as It Happens

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Finding the learning

My question is: how can we assess learning as it happens, to find the learning that goes on seemingly invisibly in the classroom? We teachers are past masters (and mistresses) at assessing learning in hindsight — through some sort of examination; assessing learning in action is new to us.

Why is finding the learning important? Because as teachers we can feel when a class is going well and think we can explain why: we're getting our content across — and all (or enough) of it and in an order that makes sense; we're making sense; we're feeling in control or challenged, depending on our preferred style; we've plenty of questions or dialogue; we notice that the class is busy and noisy — or the opposite, depending on the discipline. If we feel that a class is going well, most of us would say that there must be learning going on. We don't *know*, of course, because students might just be playing along or they might be good at pretending, that is, they might be playing at being good learners. It's hard to know (most of us teachers are, of course, just playing at being good teachers; we're just “muddling through,” as Stephen Brookfield (2006, p.1) puts it.

So, *how* to assess what's going on in the learning situation is one problem.

Finding the learning is also important because we currently assess learning — in fact, we tend to define learning — in econometric terms.² For example, what is considered best practice in assessment, namely, the “constructive alignment” of aims, objectives and outcomes theorised by Biggs (1996; 2003) in the 'nineties and now orthodox in higher education is often *destructive* because it is practiced less flexibly and educatively than it might be. (Biggs himself describes “trapp[ing]” learners in a teaching system as if this were a good thing [2003, p. 2]). I call this *end-stopped* teaching and learning, or

¹ Sturm, S. (2012). Invisible Ties: Finding Learning as It Happens. In M. Protheroe (Ed.) *Navigating the River: Proceedings of the 2011 Annual International Conference of the Association of Tertiary Learning Advisors of Aotearoa/New Zealand (ATLAANZ)* (pp. 129-147). Auckland, New Zealand: ATLAANZ.

² For econometric measures of teaching and learning, which assess quality as efficiency rather than excellence, see Anderson (2008, p. 257). For the link between econometric teaching and learning and formative assessment, see Black & Wiliam (1998).

“teaching [and learning] to the test” (Sturm & Turner, 2011, p. 19). We decry this in schools (well, some of us do), while lauding it in universities. In other words, *what* to assess in the learning situation is another problem.

Not only, then, does this kind of assessment fail to account adequately for learning, but it counts the wrong things (of course, whether we want to count to right things, if to count them is to control them, is questionable).

Assessment for learning: How and what to assess

Such end-stopped assessment focuses on assessment *of* learning: examinational assessment that aims to prove learning. Assessment of learning tends to rely on formal and summative assessment. Instead, we should focus on assessment *for* learning³: educative assessment⁴ that aims to improve learning. Assessment for learning relies on informal and formative assessment, by teachers of — or rather *for* — students and by students for students (not to mention, by students for teachers). That’s where the real learning action is, but we miss most of it when we focus on the products of learning (essays, exams, tests, etc.) at the expense of the process of learning (curiosity, questioning, reflection, etc.). (Remember that summative assessment is not necessarily bad; as Table 1 suggests, it can be used formatively. And formative assessment can, it must be said, be used badly, for example, if we give cul-de-sac feedback that is unclear, impractical or just plain destructive.)

³ See Black, Harrison, Lee, Marshall, & Wiliam (2003; 2004).

⁴ See Wiggins (1998) which opposes “educative” or forward-looking assessment to motivate learning to “audit-ive” or backward-looking assessment to measure — or audit — what has been learnt (p.7).

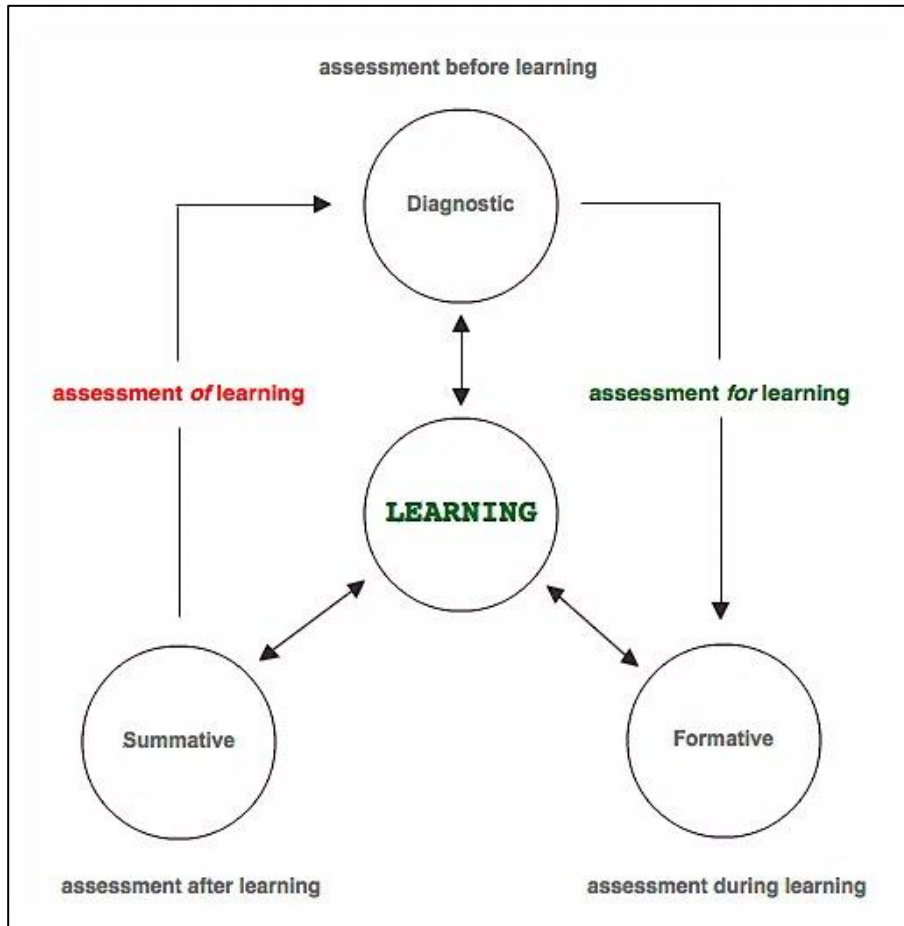


Figure 1. Assessment before, during and after learning (after Robertson, 2008)

What follows is an assessment menu; assessment can happen, to put it in culinary terms, before (diagnostic), during (formative) and after the meal (summative). The ticks mark the comfort level of teachers and learners.

Table 1. *Types of assessment*

Diagnostic Before	Formative during	Summative after
formal [✓]	formal [✓✓]	formal [✓✓✓]
informal [✓]	INFORMAL [?]	informal [✓]

More fully,

- a. diagnostic assessment is like asking the customer what they want to — or can — eat, or how they like their food cooked;
- b. formative assessment, like tasting and seasoning the food as it is cooked — ideally, if this were possible, by allowing the customer to taste it; and
- c. summative assessment, like tasting the cooked food and/or asking the customer what they thought of it.

Some of the forms of feedback and feedforward in Table 1 both teachers and learners are very familiar with, namely,

- a. formal summative assessments like exams, essays and external review (✓✓✓).

They are rather less so with

- b. formal formative assessments like proposals, drafts and peer review (✓✓).

They are even less so with

- c. formal diagnostic assessments like DELNA (the University of Auckland’s English language proficiency test) or university entry criteria, and informal ones like categorisation based on ethnicity, gender, age or class (✓); and
- d. informal summative assessments like mock exams and essays, and peer assessments (✓).

They think (and think they know) very little about

- e. informal formative assessment (?) — though it is, in fact, the most common form of assessment.

Formative assessment is usually thought of as feedback and feedforward on work in progress, group work and so on, that is relatively formal in nature. Yet informal formative assessment by us as teachers (not to mention our students) — what Ruiz-Primo (2011) calls a necessary and necessarily “unceremonious type of formative assessment” (p. 15) — goes on continuously in the classroom. It is assessment that “take[s] place in the course of events, but which [is] not specifically stipulated in the curriculum design” (Yorke, 2003, p. 479).⁵

⁵ See Shavelson and Stanford Education Assessment Laboratory (2003) and Harlan (2003). Bell and Cowie (2001) distinguish between formal or planned formative assessment, which focusses on feedback from a whole class at key moments, and informal or interactive formative assessment, which focusses on feedback from any student any time (p. 65).

Such assessment is, for the most part, “intuitive”; it is learnt through practice and “felt” (taking “feeling” to be both cognitive and affective). That is to say, we teachers continually assess students as we teach: informally, through their affect, body language and verbal responses, and less informally, through classroom discussion, exercises and co-teaching. We are expert collectors of oral, written, graphic, practical and non-verbal evidence (Ruiz-Primo, 2011, p. 15) — although, when we reflect, we tend to think (mistakenly) that the most important evidence is oral, that is, “assessment conversations,” or those “daily instructional dialogues that embed assessment into an activity already occurring in the classroom” (Ruiz-Primo & Furtak, 2006, p. 207).

Oral evidence includes students’ questions and responses to questions, polling students, eavesdropping on groupwork (“fish-bowling” (Exley & Dennick, 2004, pp. 65-66)), and so on. Written evidence includes students’ Post-It notes (perhaps for “fears (or hopes) in a hat” (Sugerman, Doherty, & Garvey, 2000, pp. 34-35)), groupwork feedback “scribed” by the teacher, and other classroom assessment activities like “muddiest point” responses, “minute papers” and “one-sentence summaries” (Angelo & Cross, 1993). Other evidence is graphic, like drawing, images, mind or concept maps and other “graphic organizers”⁶; practical, like the observation of students conducting experiments or other practical activities; and, most importantly, non-verbal, like “body language”⁷ and bodily orientation (Ruiz-Primo, 2011, p. 15).

Ideally, these on-the-spot assessments⁸ — or interventions — feed back more or less immediately into our teaching as instant feedback, affective, cognitive and dialogic. I call this feedback a *transactional feedback loop*,⁹ after Miller and Seller’s (1985) classification of the three orientations possible in curricula: transmission, transaction and transformation (see Miller, 2007, pp. 9-13).

⁶ See Robinson & Kiewra (1995).

⁷ See Roth (2001).

⁸ See Shavelson (2003).

⁹ For transactional feedback, see Pope-Ruark (2011).

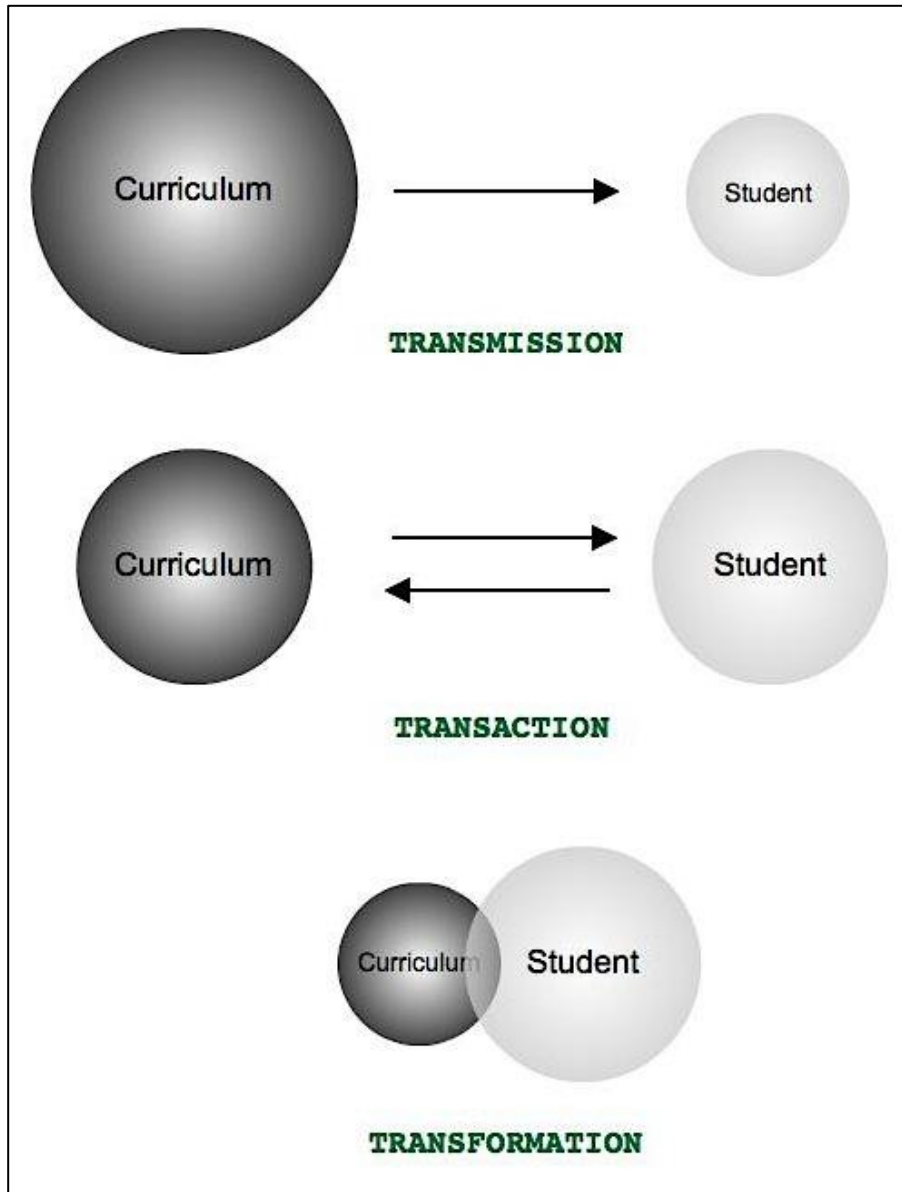


Figure 2. Miller & Seller's three learning orientations (after Miller, 2007, pp. 9-13)

(Notice that teachers are conspicuous by their absence: it seems they are to be identified with their [!] curricula. A pyramid not unlike Aristotle's rhetorical triangle (Kinneavy, 1971, p. 226) of *ethos* ["character": author], *logos* ["reason": argument] and *pathos* ["emotion": audience] — viz. teacher, curriculum and learner — might better represent this nexus.

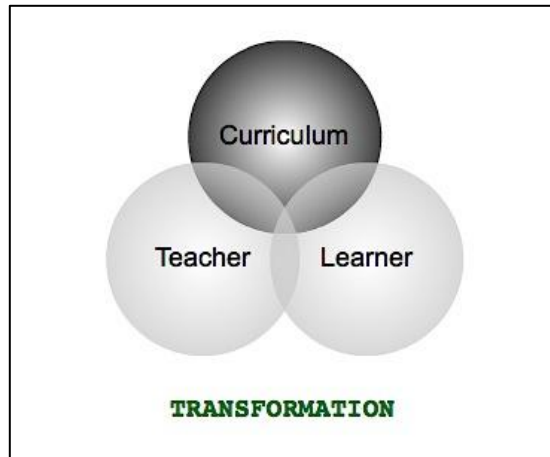


Figure 3. The pyramid of transformative curriculum.

Strictly speaking, for “teacher,” we should read “teacher-learner”; for “learner,” “learner-teacher” [see Figure 4].)

Whereas transmission relies on instruction and imitation, transaction enables dialogue and problem-solving (Miller, 2007, pp. 10-11), namely, co-construction.¹⁰ Thus, we teachers learn as we teach ... and learners teach for us to learn, forming a feedback loop in which our roles are exchanged.¹¹

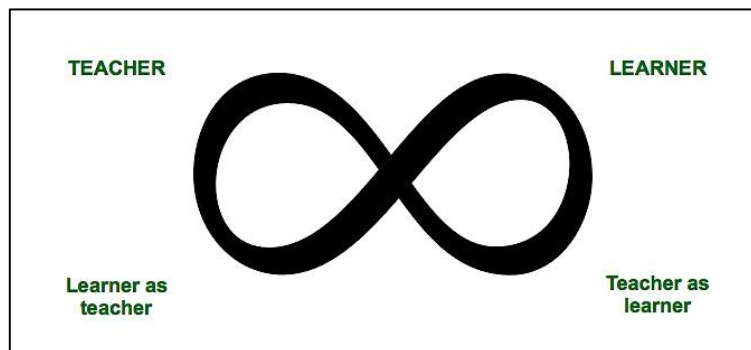


Figure 4. The transactional feedback loop

From the feedback loop emerges a *teachable moment*, a moment at which, or better, a movement through which, development — transformation, even — is possible (Havinghurst, 1952, p. 7). For this reason, a better term might be *teachable movement*.¹² If what Miller and Seller call transformation, their third curriculum orientation, aims at

¹⁰ The idea of co-construction parallels Lev Vygotsky (1978) on *obuchenie*, in Russian, “teaching/learning” (p. 90) and the Maori practice of *ako* (Keown, Parker, & Tiakiwai, 2005, p. 12).

¹¹ See Murray (2006).

¹² See Wiliam and Leahy (2007, p. 35).

“authentic learning” and “mak[ing] . . . connections” (see Miller, 2007, p. 12), how to notice and nurture it, how to teach transformatively, is the question.¹³

The formative assessment cycle (*how to assess*): N4R

It is through a *formative assessment cycle* of five actions: notice, recognise, respond, record, revisit (N4R), a.k.a. “planning on our feet,”¹⁴ that we can positively feed back on the learning attributes at work in students’ learning behaviours as they happen by prompting, acknowledging or rewarding them, and feed forward into their future learning.¹⁵

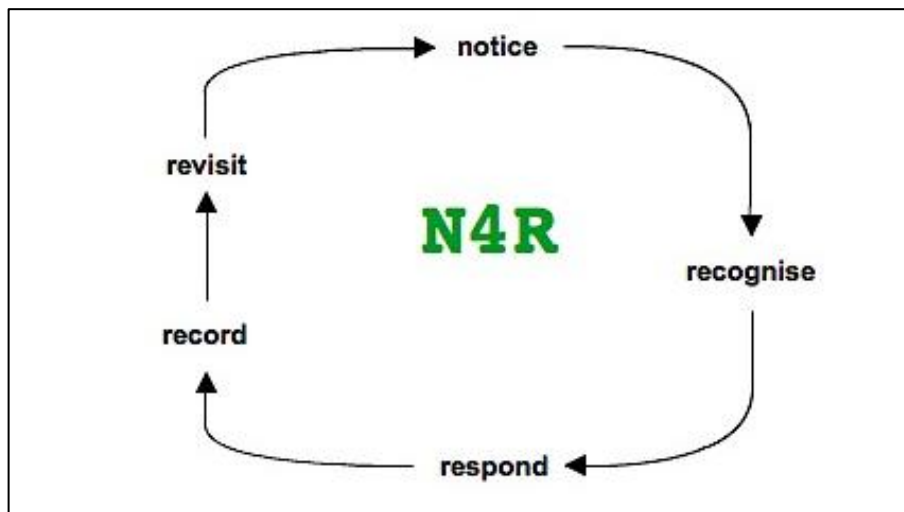


Figure 5. The formative assessment cycle

Compare the orthodox curriculum design cycle (design, implement, evaluate — D.I.E., indeed — with add-ons),¹⁶ by which we plan ahead (or *in the head*, rather than on our feet), and assess and evaluate mainly in hindsight. Through the heuristic of the formative assessment cycle, I *notice* learning happening, *recognise* it as an instance of learning, *respond* by *acknowledging* it and *recording* it (saying something affirmative and writing it down, for example) and *revisit* the moment in discussion (or writing) later. But what do we notice when we “notice learning happening”? What are we looking to nurture?

¹³ See Mezirow (1997).

¹⁴ I am indebted to Jacqui Sturm of the Education Leadership Project for alerting me to the idea of a “cycle of planning” and “planning on your feet”; see Ramsey, Breen, Sturm, Lee, and Carr (2006).

¹⁵ The formative assessment cycle echoes Socrates’ maieutic method, viz. teaching as intellectual midwifery; see Leigh (2007), drawing on Plato (1986, pp. 97-102; 148e-151d).

¹⁶ Compare Kolb’s (1984) experiential learning cycle: concrete experience (feeling), reflective observation (watching), abstract conceptualisation (thinking), active experimentation (doing), and so on (p. 21).

Learning attributes (*what to assess*): The 5LA's

I would propose we look for a set of what Claxton and Carr (2004) call “learning attributes” (LAs) or “dispositions in action” (Carr, 1995). These attributes can serve as learning outcomes to be nurtured in the classroom and elsewhere, and which, to a degree, map onto the kind of graduate attributes that we seek to cultivate in our students (at my institution they constitute what is — rather forensically — titled the “Graduate Profile” (University of Auckland, 2003)). They also give substance to the rather nebulous attributes of Miller and Seller’s (2007) transformative curriculum orientation, namely “authentic learning” and “mak[ing] ... connections” (p. 12). Interestingly, read in this order, the learning attributes form a kind of *learning narrative*:

Table 2. *Learning attributes* (adapted from Carr, 2001, p. 17)

Learning attribute	Learning narrative
Curiosity	taking an interest
Trust	getting involved
Confidence	expressing an idea or feeling
Persistence	persisting with difficulty
independence	taking responsibility

These dispositions come from that other non-compulsory sector: early childhood education.¹⁷ Why might they be useful to understand assessment at the other end of the education system? Because early childhood education is all about formative assessment, formal and informal: we higher educators can learn a lot from early childhood educators about formal assessment.

Carr (1995) argues that the dispositions can be variously taught, more or less formally. They can

- (a) provide examples or models of the disposition, (b) encourage and orchestrate [student-student and student-teacher] interactions involving the disposition, (c) directly teach the disposition, and (d) value the disposition, so that chance remarks and attention provide implicit affirmation and support. (p. 13)

¹⁷ See the *Te Whariki* early childhood curriculum (Ministry of Education, 1996), which combines formative assessment, co-construction and a bicultural lens.

We can apply all these teaching strategies in higher education; here I focus on two strategies, one formal and one informal.

1. *Formal*

Learning attributes can be “assessed” in a relatively formal feedback process. For example, the competencies of standards-based assessment, which are often formulated as learning aims and outcomes, can be unpacked into a number of learning attributes. For example, the idea of the “effective learner” can be unpacked into a tendency to “persist,” “question,” “collaborate,” etc. We can assess such attributes with a verb and an adverb: “John questions [verb: what] appropriately [adverb: how, when, etc.],” viz., more or less frequently, or appropriately, or skillfully. Progress in developing a competency can be measured in terms of three parameters:

- a. *robustness*, that is, becoming adept in “tolerating or managing the emotions of learning”;
- b. *breadth*, that is, becoming “ready, willing and able to recognize and perhaps to reinterpret the affordances of a wider learning environment”; and
- c. *richness*, that is, “develop[ing] in sophistication and flexibility” (Claxton & Carr, 2004, pp. 89-90).

In short, such parameters allow us to assess a competency’s transformative potential — or what in the parlance of attribution theory might be called its wealth of “positive affordances” or “action possibilities” (Gibson, 1986, p. 137). We can thus offer concrete and constructive feedback to students in or on formal (and perhaps, even, informal) assessments, both formative and summative — and avoid feedback based solely on liking and ranking (Elbow, 1993).

For early childhood educators, this progress can be recorded in “planning stories” (Hatherly, 2004) that establish and assess the aims, objectives and outcomes of teaching & learning of the class — co-constructed curriculum design — for the class or for students, seeing curriculum as a “work in progress” rather than a “list of detailed expectations in advance” (Fleet & Patterson, 1998, p. 35). We higher educators have as yet no method as robust, broad or rich.

2. *Less formal*

These attributes can also be fed back on less formally. When we teachers find these learning dispositions at work in students’ learning, as observed in the actions or behaviours that embody them — say, in a discussion, group work, and so on — we can positively feed back on them by prompting, acknowledging or rewarding the action or behaviours, such that the actions feed forward into the future actions or behaviours of students. For example, I might *notice* a student explaining themselves in group work,

recognise it as an instance of confidence and trust at work, *respond* by *acknowledging* it and *recording* it, and *revisit* the moment in one-to-one discussion later.

A disposition to learn (D2L)

But what we are really looking to nurture is the *disposition to learn* (Claxton & Carr, 2002), an emergent property, as it were, of the learning narrative by which formative assessment becomes transformative (Sadler, 2002). The disposition to learn is what Dweck calls, by another name, a “growth mindset” (Richard, 2007):

...people’s self-theories about intelligence have a profound influence on their motivation to learn. Students who hold a “fixed” [i.e. static] theory are mainly concerned with how smart they are — they prefer tasks they can already do well and avoid ones on which they may make mistakes and not look smart. In contrast, she said, [those] who believe in an “expandable” or “growth” [i.e. dynamic] theory of intelligence want to challenge themselves to increase their abilities, even if they fail at first. (Dweck, 2006, as cited in Krakovsky, 2007)¹⁸

Learners of the former group believe intelligence is based on innate ability (they are “naturals”) and must be demonstrated; those of the latter group believe intelligence is based on hard work and learning, and can be developed (it can be nurtured). This self-theory has implications for their learning and for them as learners, as summarised in Table 2.

¹⁸ For the disposition to learn in the world of “mass intellectuality,” or “immaterial labour,” see Virno (2007, p. 6).

Table 3. *Fixed and growth mindsets* (after Dweck, 2006)

Fixed mindset	Growth mindset
Intelligence	
intelligence is fixed	intelligence can grow
∴ we must demonstrate it	∴ we can develop it
Learning	
→ performance goals	→ learning goals
<i>extrinsic</i> motivation	<i>intrinsic</i> motivation (curiosity)
rewards success, competition and mystery	rewards effort (persistence), cooperation (trust) and communication (confidence)
The Learner	
→ learned helplessness	→ determination
→ a sense of fatalism	→ a sense of freedom (independence)

As the right-hand column in Table 2 suggests, what I called our learning attributes (after Carr, 2001), namely curiosity, trust, confidence, persistence and independence, map well onto aspects of Dweck’s growth mindset (see Table 3).

If we want to cultivate — or rather, activate — graduate attributes like “intellectual openness and curiosity” or “[a] capacity for creativity and originality,” to name just two in the University of Auckland’s “Graduate Profile” (University of Auckland, 2003), we need to foster a growth mindset in learners. The growth mindset and formative assessment intersect in the idea that, as Dweck puts it, “changing a key belief — a student’s self-theory about intelligence and motivation — with a relatively simple intervention can make a big difference” (as cited in Trei, 2007).

A simple example of such a transformative intervention might be letting students learn from their mistakes. In my writing classes, I adopt what I call an “erratological” approach to practising writing (Sturm, 2009), whereby students are given licence to make mistakes and learn rules in and through their breaking: we study errors in writing (some bad, some good) *to better make them*.¹⁹ This fits to a degree with what Dweck (2007) says about error — or “failure” — and growth: “in the growth mind-set, students care about learning.

¹⁹ See also Williams (1981) and Weathers (1980). (The clause “we study errors in writing *to better make them*” of course errs in splitting its infinitive ... but thereby proves its rule.)

... In the face of failure, these students escalate their efforts and look for new learning strategies” (p. 35). But an erratological approach sees error as a positive rather than a negative affordance (Gibson, 1979/1986, p. 137), that is, it cultivates it for its critical or creative possibilities. In the writing class, this might involve offering mini-lessons to explore grammar “errors” that come up in passing; finding our characteristic error(s), which may well mark a characteristic sentence, a turn of phrase, that embodies our turn of mind; or cultivating what Weathers (1980) calls “Grammar B,” an alternative (“alternate”) or *errant* grammar that deforms “normal” grammar to communicate more persuasively.²⁰

Thus, to teach for growth or transformatively is to teach positively and “possibly,” that is, “conditionally” — to elicit or offer alternatives (Langer, Hatem, Joss, & Howell, 1989). In this way, we can foster a disposition to learn.

From classroom as black box to classroom as network

Finding the learning is an easy, practical, non-threatening way to shine a little light on what is going on in the “black box” of the classroom (Hattie, 2008), and, hopefully, to foster the disposition to learn (D2L) in our students. But might it not be better to leave the classroom dark? After all, as Latour (1999) puts it in his definition of black-boxing, “scientific and technical work is made invisible by its own success,” that is to say, that “[w]hen a machine runs efficiently ... one need focus only on its inputs and outputs and not on its internal complexity” (p. 304). Perhaps it is unnecessary to posit a disposition to learn; perhaps noticing learning attributes, or failing that, learning skills, is enough. Perhaps it is better that the learning attributes on which it is based remain hidden, lest they are taken to be a set of boxes to be ticked. Perhaps it is the case that to measure a disposition to learn is to create it ... or to destroy it (an observer effect), or that for learners to know it is to be measured changes it (a Hawthorne effect).

There is more to informal formative assessment than the relatively formal feedback mechanism of the formative assessment cycle (N4R). But to internalise such a heuristic can inform our “feel” for the classroom as teachers, our “intuition-in-action,” or “immediate experience of a teaching situation in its entirety,” embodied, embedded and enacted (Johansson & Kroksmark, 2004, p. 377).²¹ The formative assessment cycle illuminates the classroom as less a container for teaching and learning (Leander, Phillips, & Taylor, 2010) than a network of verbal and non-verbal interactions, of (largely) invisible ties. These ties, in turn, are revealed to be not puppets’ strings but feedback loops from which emerge truly common learnings — and through which education transforms teachers into learners and vice versa.

²⁰ For a summary of Weathers’ “grammar B,” which involves errors like sentence fragments, labyrinthine sentences and neologisms (all of which I use here), see Romano (1988).

²¹ Compare Schon’s (1982) rather more distanced and dialogic “reflection-in-action” (p. 128).

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