Supporting proximal formative assessment with relational discourse

Rachel E. Scherr, Hunter G. Close, and Sarah B. McKagan – Department of Physics, Seattle Pacific University

Formative assessment: Among the most valuable tools for enriching student understanding in science

	Goal	*Emphasis*	*Example*
CLASSICAL	Create structured activities that engage/display student ideas	Responsive lesson planning	"Their white boards don't show whether they are conserving energy. Tomorrow I will have them do Energy Theater so I can see their model of energy in more detail."
PROXIMAL[1]	Create discourse environment in which students speak their minds	Responsive interpersonal interactions in real time	"I don't know what she meant just now by the term 'perpetual motion'; I'm going to ask her if this is an example of that."

Theoretical framework: Rogerian psychology [2-5]

People are resourceful and self-improving.
Self-examination requires courage.
You can help by being
genuine, acceptant, and empathetic.

contrast to Freud:
People are helpless and self-destructive.
Anxiety motivates people to accept difficult truths.
Professionals fix people by being remote, interpretive, and confrontational.

Special condition:
Deliberately created environment of assurance invites openness.

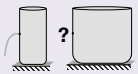
Promotes PFA

Normal ambient condition[6]:
Remoteness, falseness, evaluation, and attempts to fix people are threatening and cause concealment.

Inhibits PFA

Relational discourse

As part of a Maryland tutorial on pressure, students are considering whether the strength of the squirting is determined by the depth of the hole, or the weight of the water above the hole.



Joel: OK, so you say, so you're saying it won't shoot out as far, so this will do something different than the little
Sarah: It'll be like weaker, the acceleration of the water leaving the hole won't be as fast.
Dev: Actually, no it won't.
Joel: OK, won't be as
Sarah: Because there's more area to contend with so
Joel: Good, so here you're saying there's more area here, so there's more area to contend with because it's wider,
Sarah: mmm-hmm
Joel: so it should shoot out less fast than the narrow one, that's your stand
Sarah: yeah
Joel: or your claim.
Gina: Okay.
Joel: Good, do you all agree or disagree? It sounds like you want to disagree.

Student discussion continued productively

Instructor discourse is

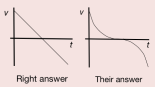
	GENUINE	**ACCEPTANT**	**EMPATHETIC**
synonyms	*Congruent, open, true to self, transparent, immediate*	*Mindset of positive anticipation; "pre-conditional positive regard"*	*See through their eyes; understand their experience*
evidence	Joel displays a relaxed openness. There is a feeling that he's "all here." The students take him at face value. When Joel has an interpretation he is transparent with it: "It sounds like you want to disagree."	Joel shows curiosity about these students' ideas, in a modest way: leans in to listen. When he arrives at the table he glides in quietly, not interrupting them, as if slipping into a show.	Joel describes these students' (unexpected!) ideas clearly. He visibly supports each idea ("Good") without appropriating it: "that's your stand, or your claim"
response	When students know where instructors stand, they feel secure.	When students detect positive interest, they feel their ideas have potential worth.	When students hear instructors represent their ideas, they feel understood.

effect: Implications for proximal formative assessment:
Learners have the courage to explore their ideas and find it is safe and productive to share with instructors and peers.

Goal:
Learning that is *original, self-directed, and integrated.*
Learners that are *creative, adaptive, and autonomous.*

Fixing (or *ideological*) discourse

As part of a Maryland kinematics tutorial, students are trying to graph velocity *vs.* time for a cart that rolls freely up and then down a ramp.



Ryan: All right, let's start thinking about the acceleration at the moment the car reaches its peak.
Lynn: The acceleration starts out fast, like high…
Julie: It's gonna be going from positive to negative
Ryan: So it's zero, (with Lynn: zero at the peak).
Lynn: That we know.
Theresa: Right, because the slope… (?)
Theresa: Yeah, we figured it out.
Ryan: We fixed it.
Tim: What does it look like? Hm.
Ryan: Cause it's going the opposite direction, so thus it would have a negative velocity.
Tim: I see.
Ryan: We're guessing.
Tim: Do you guys agree that it's curved like that?
Theresa: Hhh... We did.
Julie: We used to agree with that.
Tim: I'll let you guys discuss. That's an interesting question to consider.
Theresa: Torture. This is torture.
Julie: Where's that other guy?

Student discussion halted

Instructor discourse is

	PRESENTATIONAL	**VIGILANT**	**EVALUATIVE**
synonyms	*Poker face, remote, role-playing, mixed messages*	*Mindset of caution/suspicion; alert for trouble*	*Measure against external standards*
evidence	Tim is not literally saying "Your graph is wrong," yet he is still saying it. He physically backs away; not all here. Tim says he will "let them discuss" as if they were trying to do so, but they were not. He may be trying for proper TA behavior (rather than Tim behavior).	Tim seems apprehensive about seeing their answer (and the students seem apprehensive about showing it to him).	Tim's expressed concern is entirely with the incorrect features of the graph. He gives no indication of the students' graph having correct features that are sensible to him. When errors direct discourse, students experience their unique ideas as irrelevant.
response	When students don't know where instructors stand, they feel anxious.	When students detect negative expectations, they feel apprehensive.	

effect: Implications for proximal formative assessment:
Learners may feel threatened and conceal their ideas. The classroom is depleted of information useful for instruction.

Goal:
Learning that *reproduces established results.*
Learners *efficiently acquire expert knowledge and skills.*

"An attitude of genuine acceptance reduces a teacher's inclination to correct students' 'wrong ideas'; yet, paradoxically, this acceptance stimulates the students' own resources for problem-solving, so that what seemed like inactivity on the part of the teacher is in fact a powerful instigator of change."

Rogers, 1961

1. Erickson, F. (2007). Some Thoughts on "Proximal" Formative Assessment of Student Learning. *Yearbook of the National Society for the Study of Education, 106* (pp. 186-216).
2. Faber, A., & Mazlish, E. (1995). *How to talk so kids can learn – at home and in school.*
3. Finkel, D. L. (2000). Refusing to "teach": Separating power and authority in the classroom. *Teaching with your mouth shut.* Portsmouth, NH: Boynton/Cook Publishers, Inc.
4. Ginsburg, H. P. (1997). *Entering the child's mind: The clinical interview in psychological research and practice.* Cambridge: Cambridge University Press.
5. Rogers, C. (1961). Significant learning: In therapy and in education. *On becoming a person: A therapist's view of psychotherapy* (pp. 279-296). New York: Houghton Mifflin.
6. Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and performance. *American Psychologist, 52(6), 613-629.*

"Our first reaction to most of the statements which we hear form other people is an immediate evaluation, or judgment, rather than an understanding of it. When someone expresses some feeling or attitude or belief, our tendency is, almost immediately, to feel "That's right"; or "That's stupid"; "That's abnormal"; "That's unreasonable"; "That's incorrect"; "That's not nice." Very rarely do we permit ourselves to understand precisely what the meaning of his statement is to him. I believe this is because understanding is risky. If I let myself really understand another person, I might be changed by that understanding. And we all fear change."

Rogers, 1961

ENERGYPROJECT
Seattle Pacific UNIVERSITY
FACET INNOVATIONS
Supported in part by NSF grant DRL0822342