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

**Theoretical framework:** Rogerian psychology

**Goal:** Learning that is original, self-directed, and integrated. Learners that are resourceful and self-improving. People are helpful and self-destructive. Anxiety motivates people to accept difficult truths. Professionals fix people by being remote, interpretive, and confrontational.

**Example:** "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." (Joel)

**Emphasis:** Responsive lesson planning

**CLASSICAL** Create structured activities that engage/display student ideas

**PROXIMAL** Create discourse environment in which students speak their minds

**Relational discourse**
As part of a Maryland tutorial on pressure, students are considering whether the strength of the squirting water above the hole.

"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

**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? Hmm.

Ryan: Cause it’s going the opposite direction, so thus it would have a negative velocity.

Tim: I see.

Ryan: We’re guessing.

Julie: Do you guys agree that it’s curved like that?

Lynn: Theres: “Hmm…” We did.

Julie: We used to agree with that.

Theresa: 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).

**Instructor discourse is**

**GENUINE** Congruent, open, true to self, transparent, immediate

**ACCEPTANT** Mindset of positive anticipation: “pre-conditional positive regard”

**EMPATHETIC** See through their eyes: understand their experience

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.”

When students detect positive interest, they feel their ideas have potential worth.

Joel describes these answers (unexpected) ideas clearly. He visibly supports each idea ("Good") without appropriating it: “That’s your stand, or your claim.”

When students hear instructors represent their ideas, they feel understood.

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.

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**Emphasis:** 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.”

"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."

Joel

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Rogers, 1961

"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