

Development of Proximal Formative Assessment Skills in Video-based Teacher PD

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Theoretical perspective

Proximal formative assessment (PFA)

Erickson (2007) defines PFA as “careful attention focused upon specific aspects of a student’s developing understanding and mastery of skills, as instruction is taking place in real time.” Interpretation of evidence of student thinking is a critical and often under-supported teaching skill.

Professional vision for teaching

Sherin & Han (2004) define professional vision for teaching as “the ability to see and interpret critical features of classroom events,” and characterize the changes in teachers’ attention to and reasoning about different kinds of classroom events during a year-long professional development video club.

We describe Sherin & Han’s framework for analyzing teacher discourse about student learning, and apply it to an episode from Energy Project PD.

Levels of analysis of student thinking

Sherin & Han (2004) identify three levels of complexity in teachers’ analysis of student thinking:

Level 1 – Stating what student(s) said

- Example: reading a line from video transcript

Level 2 – Working to understand the meaning of student statements

- Examples: trying to figure out what data a student is referring to; trying to restate the student’s words in other terms

Level 3 – Generalizing and synthesizing in order to characterize the nature of student understanding

- Examples: trying to characterize the different ways a concept was discussed in a group of students, and whether the students reached consensus

Erickson, F. (2007). Some thoughts on “proximal” formative assessment of student learning. In P. Moss (Ed.), *Evidence and decision making* (pp. 186-216).

Sherin, M., & Han, S. (2004). Teacher learning in the context of a video club. *Teaching and teacher education*, 20, 163-183.

Instructional context

- Teachers participated in a 2010-2011 academic-year PD course offered through the Energy Project at Seattle Pacific University.
- Course followed a modified video club format (Sherin & Han, 2004) with meetings every 2 to 3 weeks.
- Most sessions focused on video episodes of students discussing energy ideas.
- Members of the research team led whole-group discussions and participated in small groups.



Student video excerpt

The students in this video are eighth-graders beginning their study of energy. They have seen a movie showing various phenomena: a bus driving, a bicyclist pedaling, leaves blowing in the street, etc.

The worksheet they are working on is asking them to decide how energy is involved in each of the phenomena in the movie.

The leaves in the street, do they have energy.

They are pushed by energy.



They have energy. But they do not have energy, like, to move. [...] Like, perpetual motion. You'd have to have wind to do that.

True, but are we... I mean... uh, a bus doesn't have perpetual motion.

Identifying an episode of Level 3 analysis

During the selected episode, teachers alternate between discussing what the students mean by “perpetual motion” (Level 2 analysis) and attempting to characterize student understanding(s) of the relationship between motion and energy (Level 3 analysis). They describe three possible understandings (abstracted by the authors).

ENERGY IS FUEL FOR MOTION

Energy gets used up in the process of making things move

Donna: It seems like the idea that it can always move, maybe? Not necessarily constantly moving? or has a period of time where it constantly moves...

Mark: More like it has a source, it always has a source of energy

Donna: Yeah

Owen: Yeah, that's how I think that they were using it also

John: So if you take that away you would have [hand gesture indicating “nothing”]



MOTION GENERATES ENERGY

Energy is created by (certain kinds of) motion

Mark: (Shaking finger no) I don't know if it they [actually mean] self-generated...

Ann: ...To have perpetual motion you'd have to have wind to do that, so in order to have perpetual motion...you'd have to have wind?

Donna: In other words, [making windmill gesture] to always get the turbine to blow, for example...to create electricity.



MOTION HAS TWO DISTINCT RELATIONSHIPS TO ENERGY

The motion of wind is inherently different from motions that require fuel

Ann: I think she's saying, in order for it to be perpetual motion, it has to have the wind.

Donna: It has to have wind (nodding). Not... a fuel source

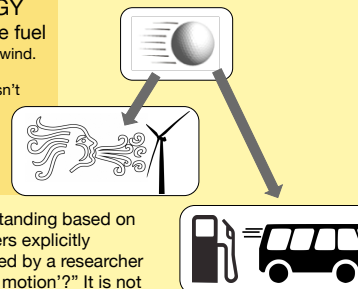
Ann: And that's what she's saying perpetual motion is. So of course the bus doesn't have perpetual motion, because it doesn't need wind. To move.

Donna: Or it doesn't use wind.

Ann: It doesn't use wind.

Later in the discussion:

Mark: And, the bus doesn't have perpetual motion, because it will run out of gas.



While we understand teachers to be proposing models of student understanding based on evidence in the video, neither the teachers nor the participating researchers explicitly identified this as a goal at the time; this segment of discussion was initiated by a researcher posing the Level 2 question, “What do you think they mean by ‘perpetual motion’?” It is not clear whether teachers are trying out different characterizations for the group understanding, or characterizing different understandings of individual students.

Conclusions/Questions

Teachers are engaging in sophisticated analysis of student thinking

- We find that participation in a video club supports teachers in developing this skill (consistent with Sherin & Han)

How much do teachers do this?

- We have seen much more of Levels 1 and 2 than Level 3 in our PD; Sherin & Han found mostly Level 3 by the end of their year-long PD course

- What stimulates teachers to do Level 3 analysis? How can we support more of it?
- Erickson (2007) states PFA of student learning is unusual and understudied.
- Is it rare in the literature because it is not studied, or because it is not happening?

What have you seen?

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