Listening to the Student Experience in Learning

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This is a story of how documentation enables all of us to listen more deeply to the student experience, hear their voices again (and again) and reconsider teaching and learning. We wish to illustrate how documentation provides the opportunity for teachers to revisit their teaching, and students to revisit the choices they make in the moments they struggle, in order for everyone involved to better understand how both the teachers and students grow towards more competent and more intentional ways of being.

Our documentation captured a learning encounter. We videotaped a small group of first year chemistry students as they worked together to attempt to understand a challenging concept. We watched the recording and converted one section, the part we thought most puzzling, into still images and transcribed dialogue. The result was a "capture" of one small slice of their struggle to understand charge distribution, which allowed us to listen more closely, to see learning unfold, and to reflect upon something tangible and concrete about their learning. This allowed us to talk about it together and share the meaning each of us sees. This documentation, and the subsequent discussions among students and teachers, has transformed our pedagogy and transformed our conceptions of what we do as leaders and participants in education.

We share below a portion of that capture. We offer it as an example of a step all teachers can take to alter the structures of higher education. This work shifts the paradigm, as Barr and Tagg (1995) described, from a discourse based in teaching, the *Instructional Paradigm*, to an alternative discourse based in learning, the *Learning Paradigm.* We believe that faculty who gather this kind of documentation take a step toward a new ideal of what school can be for each and every participant — teachers and students.

A paradigm shift challenges people to let go of old ways. According to Barr and Tagg, we have a choice to retain our inherited role as teachers, the "instructors", placed at the center, justified to assume the responsibility to be in charge of the content, justified to set sequences and texts, and justified, naturally, to evaluate the students. Or we have a choice to think of our role as creating settings with opportunities for encounters, just at the right level of disequilibrium, just at the right time, in just the right conditions, and evolve these encounters to greater levels of sophistication to responsively enable individual and collective action. We operate in the latter role when we become willing to take the time to listen to the student experience in learning.

Our story is an example of this listening. We are attempting to put the learner at the center of our investigation and shift the focus from being teachers concerned about covering content to being in a reciprocal relationship with our students in reflective practice. As we work toward disarming the power differential between our students and ourselves, we cherish the opportunity we have to help each other learn. Just as the learners are learning, we teachers are learning how to provide opportunities and how to facilitate. As we transition out of old ways of thinking toward a pedagogy based in reciprocal relationships, a truly deep listening, and a view of the student as powerful and capable, we find that our language fails us. We lack the words to describe a more democratic, open interdependence among teachers and students. We offer this example as a provocation to develop a new kind of discourse, one that differs significantly from the ways we customarily describe what we do in higher education.

Our work arose from a study group. Our Carnegie Scholar, Jim Harnish, introduced us to the Student Voices in the Scholarship of Teaching and Learning Project. He invited a group of faculty and students to meet regularly to talk about learning. As members of that group we became intrigued about merging early childhood education and chemistry as a way to investigate student voices. One of us (Owens) teaches chemistry; the other (Drummond) teaches early childhood education, which is currently deeply influenced by the Municipal Preschools of Reggio Emilia, Italy. The Italians remarkable example has challenged the world to transform all schools into amiable, democratic places of culture. Early on, Howard Gardner, Director of Project Zero at the Harvard Graduate School of Education, was attracted, also, and became friends with Loris Malaguzzi, the founder of the Reggio Emilia schools. In subsequent years much has been shared between Reggio and Harvard

about how the documentation of children's thinking and work can provide an opportunity for teachers to reflect and to listen more deeply to the children and each other. Project Zero and Reggio Children published this way of listening in a collaborative book, *Making Learning Visible* (2001), in which they explored what it meant to document learners and the learning group. In joining early childhood and chemistry, we brought the Reggio model of inquiry to higher education. We invite you to examine our example and reflect upon the possibilities provided in this deeper listening to student voices.

Our study was conducted in first year undergraduate chemistry, the traditional yearlong general chemistry sequence for science majors at North Seattle Community College, an urban commuter college with an enrollment of approximately 6000. The chemistry curriculum was designed to actively engage participants in co-construction of chemical concepts, using drawing as a means to represent and debate theories, and offering challenges to apply newly constructed knowledge to more complex problem solving and explanation of "real-world" phenomena.

How can we create the conditions that enable everyone, all of us, to gain each day in school?

How can we enable each other to be and understand in new ways?

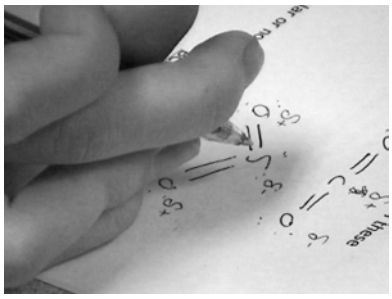
A Capture: Representing the Charge Distribution of Sulfur Dioxide

The students in this capture were encountering molecular polarity, a "big idea" for first year college chemistry. The students had already been introduced to two other ways of representing molecular polarity: partial charges and the dipole moment arrow. Just before to the sequence we recorded, the teacher had presented an additional way to represent the polarity of a molecule, which uses a color scheme to symbolize both positive and negative charge distribution.

An understanding of the chemistry concepts is not essential to an understanding of what is happening here. Everyone brings a unique way of seeing. Chemists may see it one way; the students themselves, faculty in other disciplines, and administrators may see it differently. The words and pictures enable observers to view and re-view what these students do as they encounter something they do not fully understand. In this sequence they wrestle with how to represent with colors the charge distribution in a molecule of sulfur dioxide.

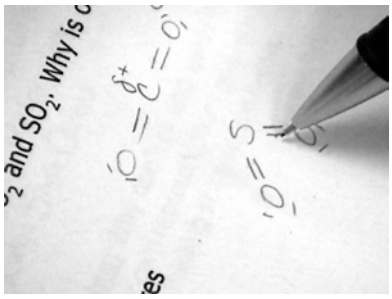
We listen to Matthew, Melissa, Shana, and Kathryn as they draw diagrams of the molecule using Lewis Structures (drawings of molecules that show bonding electron pairs and non-bonding electron pairs). Carbon is symbolized with a C, and sulfur is symbolized with an S. Molecular bonds are represented by lines, and the non-bonding electrons are symbolized with dots. After first considering carbon dioxide, they face a similar molecule, sulfur dioxide.

Matthew: Couldn't sulfur dioxide be double-bonded with each oxygen? But it would still have a lone pair, wouldn't it?
Melissa: Yes. It would have two lone pairs.



Matthew counts the electrons in his Lewis structure representation: Two, four, six, eight, twelve.

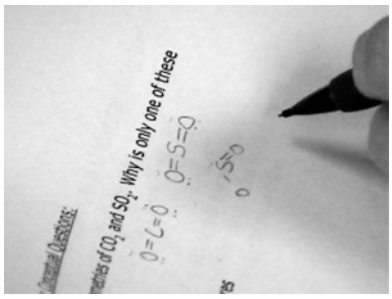
Melissa counts hers also: Two, four, six, eight. Eight for sulfur.
Matthew adds: Plus the lone pairs, because sulfur comes below.



Melissa's Lewis structure drawings of CO_2 and SO_2

Sulfur is full, though, with double bonds. Isn't it?

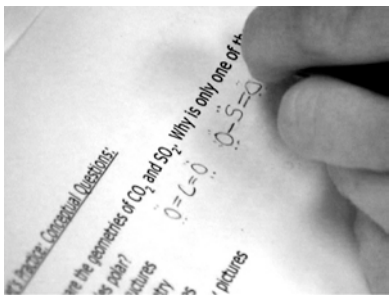
Shana: I thought there was a resonance structure. *(pause)* I don't know. Is it?



Shana redraws SO_2 below her initial attempt. She now shows it bent and with one double bond and one single bond representing its resonance structure.

Matthew says aloud as he sketches: Double bond. Double bond. Oxygen. Oxygen.

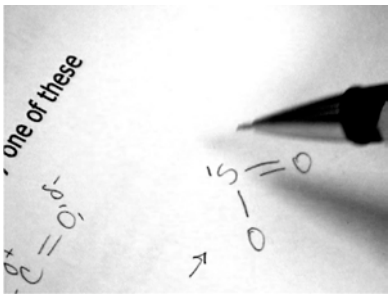
Shana: You need one double bond and one single bond.
Matthew (gets it now): Making a resonance structure.
Kathryn (now sees it also): Raising her eyebrows.



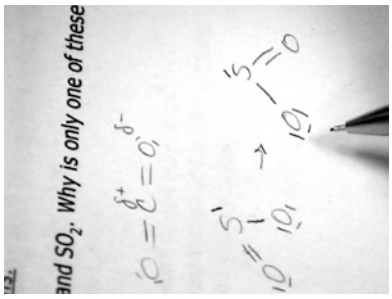
Shana erases one of the bonds and two dots she had placed above the double-bonded oxygen in her initial drawing.

Melissa: Oh. I see.

Kathryn: Yes. You could have the other oxygen. Yes.



Melissa places a mark, representing a lone pair of electrons, above the sulfur in her drawing.



Melissa redraws the molecule.

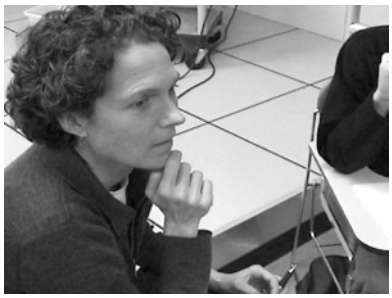
Kathryn: So this is a little more complicated.

Melissa: Now I am confused. This is coming over this way…

Melissa: Isn't O_2…
I really like working in groups, because I don't have to think of these things all on my own. It works so much better for me.

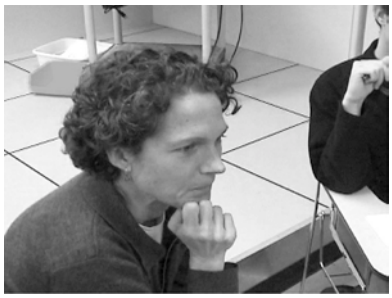
Shana listens as Melissa talks:
So the single oxygen bonded molecule…
The single-bond oxygen is the more…

Shana: Has more electrons.

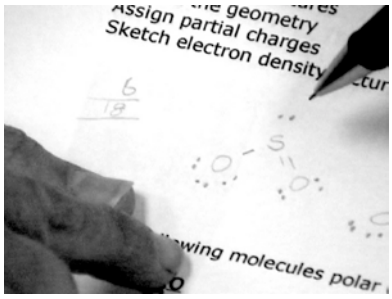


Kathryn: Has more electron density.

Melissa: It's more positive.

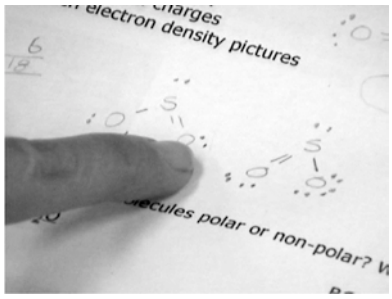


Kathryn: No. More negative.



Kathryn ponders her drawing, which is correct with all bonding and non-bonding electron pairs.

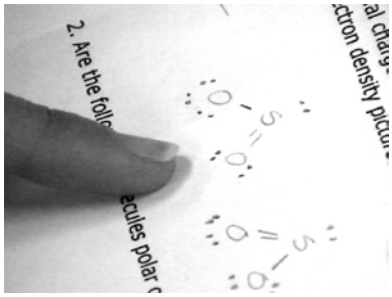
Matthew: There are more electrons over there that aren't being shared.



Kathryn: It seems like this part of it is more negative and this is more positive.

Kathryn: She says on here, predict the geometry.

Melissa: Well, we did that with this dot structure.



Kathryn: But that's not exactly telling us… Because the lone pairs affect the geometry, too, right?

Melissa begins building a model of the SO_2 molecule in order to visualize the structure.

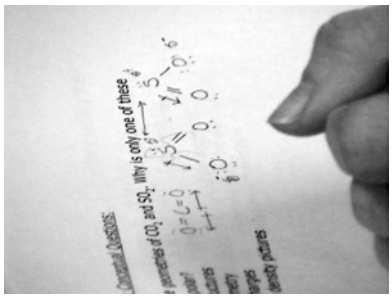
Kathryn: It's just bent. That's what the geometry is, right? So Melissa, its just bent, you don't need to…

Well you want to. *Laughter.*

Melissa: Yeah, I want to. This is more fun.

Kathryn: So, assigning partial charges…
This would be…

Shana: Three charge cloud, right? The electron cloud.
Matthew: Right.



Shana adds the negative partial charge symbol δ to her drawing.

She pauses and looks away to consider this.

Melissa holds up the model, 2 green oxygen bonded to the red sulfur: What do you call this?

Matthew and Kathryn reply in unison: Bent.

Melissa: Oh.
It's got the lone pairs and a double bond.

Matthew: It's just like water.

Kathryn: You're right, Matthew. It's like water. It's just bent.

Kathryn: This is the sulfur. We have to designate. This one is going to be the one with the double bond, ok?

Melissa points to the double-bond side:
So this is the more negative stuff.

Kathryn: I don't think so, because… Is that right?

Matthew: Yeah, yeah, you're good.

Kathryn: The one with the double-bond only has two lone pairs out here and this one has three lone pairs out here.

Kathryn refers to the sulfur with her ring finger: And this one has a lone pair out here, too.

Melissa: I got completely confused.

Kathryn: So, it's more... the double-bond side is more…

Shana: More positive.

Kathryn: Yes.

Matthew: I'd say the sulfur is more… Well, only one lone pair compared to the two. But then the double-bond…

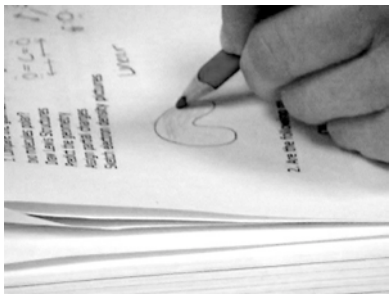
Shana: They look the same.

Kathryn: If you were going to do the cloud, if you were going to do the color diagram…

Kathryn points to the single-bond: …this part of the molecule would be more red…

Kathryn points to the double-bond:
… and this would be more blue.
Do you think that is right?

Shana: Maybe I should draw it.

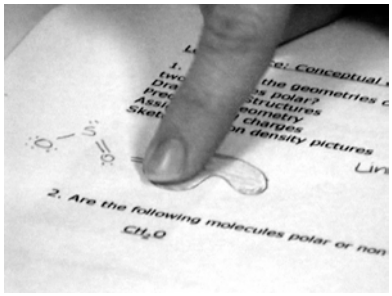


Shana: What if it was like this?

She colors a portion blue…

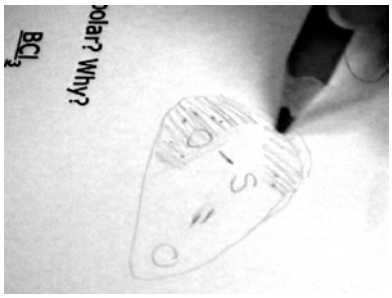
… and three other areas red

Shana describes her drawing:
I have the double bond and this part kind of red…

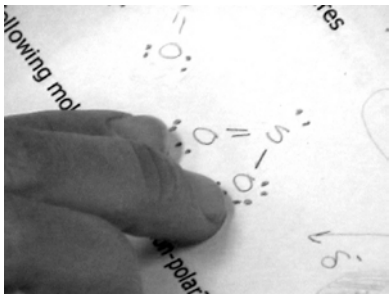


Shana: And then this part very negative. And it is bigger. It is lopsided.

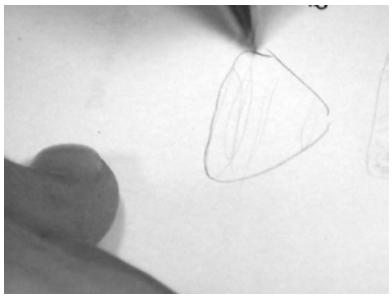
Kathryn: It seems like out here it would be kind of blue.



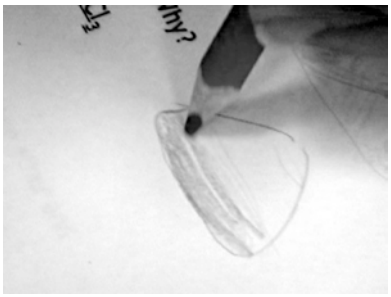
Kathryn colors her drawing.
Melissa: Yeah. That's what I did. On the outside. And the red more towards the center. Like that.



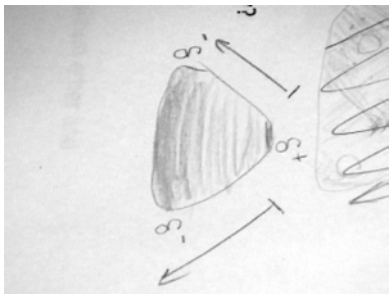
Kathryn: You know, you guys, as far as drawing this, maybe we…
I mean, if you look at how many electrons are around the oxygen at this side…



Kathryn: Maybe it's just a shape like this that is blue up here and red down here.

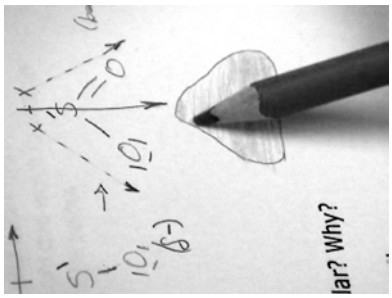


Kathryn: It is simpler than what we thought. More red is toward the oxygen.



Kathryn: So this one I'm going to cross off.

Kathryn completes the new drawing with dipoles and partial charges represented.



Melissa completes her drawing showing the resultant single dipole arrow.

Now all of the members of the group have correctly represented the molecular polarity three ways: dipoles, partial charges, and electron density colorations.

Shana considers her drawings.

Shana: I hope this is not on a test.

Laughter.

Our Reactions

In the end all members of the group seemed to achieve a satisfactory drawing, even if a full understanding awaits later study. When we first reviewed this capture, these thoughts immediately came into view for me (Owens), the chemistry teacher.

It isn't about the answer. The group seemed to adopt ideas on the basis of an unspoken satisfaction, "right" at least for the moment. Being "right" according to a standard is almost irrelevant. Oddly, only Shana had her textbook open. Rather than seek an authority, they seemed to prefer building upon what each person presently understood. It was as if they *had* to start with what they thought they knew. That sharing brought a unifying energy that sustained their interest in clarifying and building upon existing threads of conceptions. There was little interest in looking up the right answer or asking me. They seemed to enjoy the power of moving forward using their own minds in their own way.

The different languages of representation afford different views. When the group focused on the Lewis Structure representation, they continued a line of thinking that only considered how the lone pairs of

electrons and the double versus single bonds might help them predict molecular polarity. I did not realize that the Lewis Structure would be as distracting as it was. It was difficult for them to move away from this way of thinking. The shift forward in their work occurred when they used other languages of representation. Kathryn said, "She says on here we have to predict the geometry." This allowed them to concentrate less on the electrons and consider the bent shape of the molecule. Later, Shana said, "Maybe I should draw it." Once they began to create a diagram with colored pencils, it seemed relatively simple for them to get a drawing that was colored correctly using the framework of electronegativity as well as molecular shape. It is fascinating to me how each form of representation affords a new perspective in which to think, and how, at the same time, each presents limitations to thinking.

It is shocking how little we, as teachers, know about what actually happens for students. What was most striking to me was how much I normally miss of how the students are thinking. I routinely move from group to group, and base my understandings of what is happening on brief snippets of the conversations and quick glances at the representations the students have created. I often make the assumption that if the students have a reasonable drawing on their paper they are beginning to understand. Their wandering path was fascinating. In the entire 140-frame capture I was able to see the connections they made with each other and the way they used their uncertain understandings to build new ones. Their focus on the lone pairs of electrons on the oxygen atom, which led them astray, is now in my thinking. It has already helped me present this material better.

Connected knowing. I saw the importance of the care they gave to each other. It appeared that this group, although they had never worked together before, was able to stay personally connected. Everyone's contributions were valued. Everyone took risks to present ideas and conjectures. Often those contributions were phrased as questions or tentative statements with a question form added. I also saw that although each student spoke in brief phrases, almost shorthand, it was enough to sustain the inquiry and challenge the creation of meaning in the others. The capture enabled me to see small things move the group's focus one way, then another, without centralized direction, like a flock of starlings. The social dimension of group participation, interpersonal responsiveness, and openness to others was essential for learning to happen, which certainly contrasts markedly with giving this assignment to work on individually.

The Group's First Response to Being Videotaped

Even though we followed the protocol required by our human subjects review committee, we remained concerned about the impact of video recording on these students. As they were getting their coats and gear packed we kept the camera on and asked them about their experience of being watched on camera. This is a transcription of what they said.

> ***Melissa:*** I think working interactively is the greatest way to learn. I really like the teaching style here, because I always feel so encouraged. Even if I make a mistake, I feel "don't give up!"
>
> ***Kathyrn:*** If I am doing this on my own, I just try to get the right answer. When I am doing it in a group I feel like I have to explain why I am thinking something a certain way. Sometimes I am wrong, but explaining it to others allows me to understand it more.
>
> ***Melissa:*** It seems more conceptual and a lot less abstract. To talk about it and look at these things, put them together and pull them apart, enables me to create an idea that I can back up with scientific information. It is more tangible, and I remember it. It is a lot more fun, too.
>
> ***Shana:*** I have had teachers where I had to memorize, memorize, and memorize, and then it was gone. I still remember all we did last quarter with Kalyn because it was so interactive. Not that I think Chemistry every day of my life, but I actually think about Chemistry ideas in the car.
>
> ***Matthew:*** Kalyn should teach math. I could really use this in math. *(Laughter)*

Melissa: It really matters to me that she is taking the time to find out how we really learn. Really, who does that? (*She turns directly to talk into the lens of the camera.)* Thanks, Kalyn!

Shana: Yes!

We were relieved. Each thought the opportunity to struggle together to understand polarity was valuable and accommodating of their differing styles of learning. The result for them was a more durable understanding. The camera apparently was of little concern. Rather than being interference, videotaping was seen as proof the instructor cared about how they learned.

The Class's Response to Viewing the Capture

Once we converted the raw video footage to slides and had signed releases in hand, we showed the capture to the entire class. The participants, Matthew, Melissa, Shana and Kathryn, read aloud their own statements on each slide. Afterwards we asked the class members to write their responses to seeing the capture. Here are representative samples.

Students in the capture:

> "Watching the PowerPoint gave me an opportunity to be an observer of my own learning process. I was able to see how I took risks by saying that I was confused or making an assumption that later appeared to be inaccurate. I like the ability to brainstorm with others. I feel this experience has 'kicked it up a notch' in regard to my learning process. I feel this experience has helped me exceptionally grasp the concepts in this chapter."

> "In watching the PowerPoint of our interactions I was surprised by how much we built our understanding together. How much we completed each other's sentences. I could see how each person in the group contributed the pieces that they understood or misunderstood. (Even the misunderstandings were very helpful to our learning). Having to explain how we thought really helped us clarify our thoughts."

Students not in the capture:

> "The slides pointed out how learning something is a step-by-step process. You make a connection and then based on that you can make another connection and you figure things out by building on these connections."

> "Watching them figure it out, though, confused me a bit. They brought up questions that weren't clearly worked out that left me more confused. I feel that I now need to review the material! Which maybe is actually a good thing!"

Anecdotally, I (Owens) saw a qualitative change in the way the students worked together throughout the rest of the year. The students who were in the capture became highly regarded; others often asked them for their contributions. I also think this experience was a metacognitive transformation for everyone in the course. After seeing the capture all the students seemed to see themselves as people who figured things out together. Instead of coming into the chemistry classroom dreading the day, they were eager to become engaged in the next challenge. It is as if the opportunity to see themselves as members of a learning community enabled them to find their own voices.

Final Video Interview of the Students Who Were in the Capture

At the end of the year, just after the students took their final exam for general chemistry, we invited them to be interviewed again. Unfortunately, Melissa was absent. Since we did not know exactly what we were looking to discover, we simply offered an opportunity for to them to talk about whatever they liked. Mostly they discussed the course and how it was taught, but this segment of the recording pointed to their metacognitive transformation.

> ***Matthew:*** This experiment on was on learning something new and expanding it. I saw benefits across the board. I was looking forward to coming to class afterward, not

that I wouldn't anyway, but it was more so. There was more of a group dynamic, the whole class was more group oriented, and I felt that my ideas were being discussed in a small circle, as opposed to sitting, hearing and going home.

Shana: As I read through the printout of the slides I thought, "Well, this is my learning process, obviously. You can't really be embarrassed about how you learn." You are going to make mistakes. It is normal. I think everybody in the class understood that. There is no need to be worried about that.

Kathryn: I thought it was interesting to see myself and see how I interact with other people. It is another piece of learning.

Matthew: Showing it to the rest of the class was fun. I am glad it wasn't in motion pictures, because, well, it's like answering machines: something about hearing your own voice bothers me. But I didn't have a problem seeing the pictures. That was fine. That's how I have been projecting myself for 20 years, and it has been fine, so why change now? *(laughter)*

Shana: People still like me.

Matthew: Exactly. Obviously I am interacting with people so something is not completely wrong. *(laughter)*

Matthew: I just read through my lines. As I said them aloud I was thinking, "Yeah. That would be something I would say." Looking back at it again, rehashing in your mind what you said, and saying it again even, shows you the path. Once you have done it once, see it again, and go back and do it again, you can see where it diverges. When you think about it, you see, "I could have gone this way, but I chose to go this way." You can see the chain of events that I followed.

Kathryn: Being videotaped and seeing ourselves was helpful because it showed me how I interact with other people. I agree that for the most part I think, "Well, that's just the way I am." But I reflected on myself. Maybe I could change some things. I could be a better listener or not jump in so quickly and things like that. It is part of life to be able to do that kind of group work.

We see here how the capture, and reflection on the capture over time, advanced their understanding of their own learning. They saw themselves as people willing to take risks, willing to be uncomfortable with not knowing, and valuing their interactions with others as essential to their own success. They were no longer passive receivers of knowledge transmitted by authoritative teachers; they were co-inquirers. They demonstrated they were, in feminist terms, "constructed knowers", the highest level in the epistemology described in *Women's Ways of Knowing* (Belenky, et al, 1986/1997) as well as in the epistemology offered by Perry (1981) as "commitments in relativism". We concluded that our listening to the voices of these students supported the development of not only their cognitive and ethical growth but also their voice.

Conversations Among Faculty

We wondered what our colleagues would see in this capture, so we offered the other chemistry faculty the opportunity to discuss it. We recorded that discussion, too. The discussions ranged over a variety of topics, but these words of one of our colleagues in the chemistry department pointed out how teachers can learn from other's documentation.

"It was interesting to watch and reflect on my own style. I see myself jumping in more often to get them on the "correct" thing, but way too soon. The more I watched the more I appreciated the process these students went through. I realized that they didn't need the instructor's help really. I see my personal tendency to want to go in there and get them in the right direction, but that would have been detrimental to their learning process. I would have taken them off: my mind would have taken over the

problem solving which is not conducive to their learning. I can see a flaw in my own style. Watching that, seeing how well they did, and knowing how I would have reacted if I had been around them going, 'No. No, you guys. Wait.' was a good experience."

"Sometimes when I give students a project like that where they work in groups to solve it, I feel I am approached by them with "tell me the answer." That is what they have wanted, so I have done that for them, a lot. What I see in this capture is very contrary to what happens in my class, because they were just diving in. They were not seeking out the instructor, even when she was close by. I thought that was pretty great."

We have seen the effects of this documentation on ourselves, the students we listened to, their peers in the classroom, and our own colleagues in teaching. The capturing of the voices of students in their learning opened an opportunity for everyone in the learning enterprise to reflect upon how they think about what they are doing and what they value in our classrooms and schools. By closely examining the events of the classroom we open the possibility to discover what we might otherwise miss and, together with others, to create enhanced practices that benefit everyone's learning.

In the documentation we saw how Matthew, Melissa, Shana, and Kathryn were being powerful and capable. We saw how their learning did not proceed in a linear way but in fluid and tentative wandering. We saw how the construction of knowledge was a group process where each was nurtured by the conjectures and responsiveness of others — some confirming, others questioning — toward new connections and understandings. We saw how each person had unique contributions, pace, and strategies.

In our discussions of the documentation with other faculty, both chemists and non-chemists, we enjoyed hearing the unique perspectives they contributed not only about the students but also about their own understanding of teaching. These conversations about pedagogy were comparable to the student's conversations about polarity. Both sets of conversations were stimulated by the documentation. Imagine what would happen if we had general agreement that the conclusions in the paragraph above concerning the students also applied to teachers learning how to teach. If we thought teachers were powerful and capable, if we thought learning to teach was a fluid and tentative wandering, if we understood pedagogy was a group process nurtured by the conjectures and responsiveness of others, we would transform higher education. We could design opportunities for teachers to create meaning together, in groups, working to co-construct an evolving understanding of pedagogy enabled by documentation.

Listening to the Voices of the Students

First we need to find a way to access the voices of the students, and then we need time to construct together the meaning of what it is we hear. We cannot really know what is happening in the minds of each unique and diverse student. We may do our bits of listening and watching, but we only see what we are open to in that moment, and our perceptions and expectations filter what we see. If we can admit that this is true, we must also admit that we are necessarily uncertain about how best to teach. Therefore, we must be willing to embrace that uncertainty and position ourselves less as "masters of the truth" and more as creators of space where those directly doing the learning can act and speak on their own behalf.

We offer the capture method as a tool to allow teachers to listen more carefully and to participate in meaning-making and reflection. These are essential processes in learning and growth.-This form of documentation recognizes and values complexity and context while remaining concrete. Most remarkably, the reflective dialogue it stimulates directly alters the educational experience; students change and teachers change without a need to convince anyone of anything. John Dewey (1938) describes the work this way:

> A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and social, that exist so as to extract from them all that they have to contribute to building up experiences that are worthwhile. (p. 40)

Documentation not only leads us to what is worthwhile, it has a direct, profound effect on the participants themselves. It presents incontrovertible evidence that students are indeed powerful and capable — especially when they are confused or mistaken — which enables all of us involved in education to work together to modify the conditions of the educational experience so their capabilities can flourish. With documentation students can revisit their own experiences; they can see how aspects of their participation illuminate complex and multiple actions, both social and conjectural, sustain the knowledge-building process. In documentation, both teachers and students can see learning, not as something the students do, but something faculty and students do together. Documentation creates an opportunity for reciprocity that moves us a step forward toward an ethic of practice.

Just like these students, we teachers need our communities for co-construction, with each other, of what is satisfying in higher education classrooms. We are aware of beautiful teaching and learning when we see it or live it, without the need for numbers or measures. All of us face the need for something to examine together, something specific, complex, and nuanced to reflect upon, in order to honor the differences in the way each of us perceives the world and expresses ideas. All of us face the problems of working cooperatively together, of solving problems, of examining habitual practices, of bringing self-critical awareness of our own uncertainties, and of offering, in mutual comfort, tentative conjectures and hypotheses. All of us face co-creating a future through interactions in the present. All of us face an expectation that we wish to move towards an ideal, a beautiful dream of our own abilities to do well.

How do we nurture that space? We suggest documentation — the gathering of traces of experience in photographs, recordings, and products — to enable teachers and students to revisit events in our classroom, contribute our differing views of what we see, make meaning, create shared values, and transform our expectations and culture. The dialogues we have about the meaning we see in the documentation give higher education a learning focus: to create an amiable space for learners and teachers, not only for the transmission of what the teachers know, but also for knowledge-building by students and teachers alike. The more diverse perspectives we have engaged in meaning-making about the complexities captured in documentation, the more we can help each other learn about what it is we do. All of us gain when we listen to student voices.

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